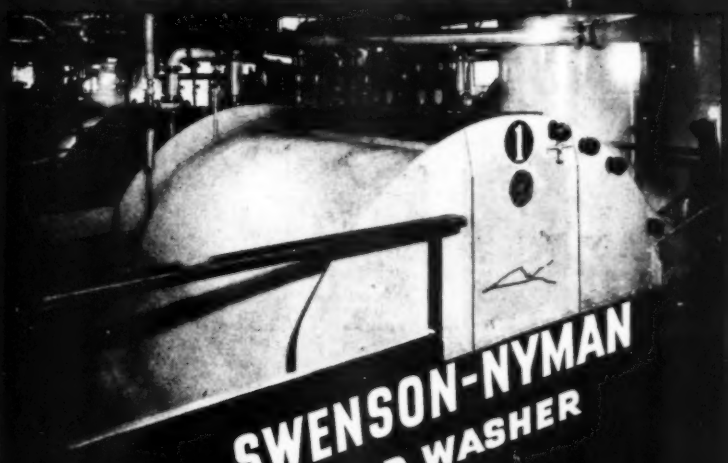
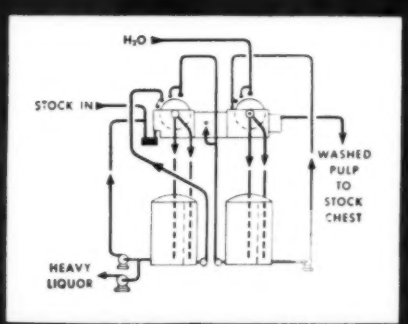
THE PAPER INDUSTRY
and PAPER WORLD

NOW AVAILABLE FOR SULFITE PULP



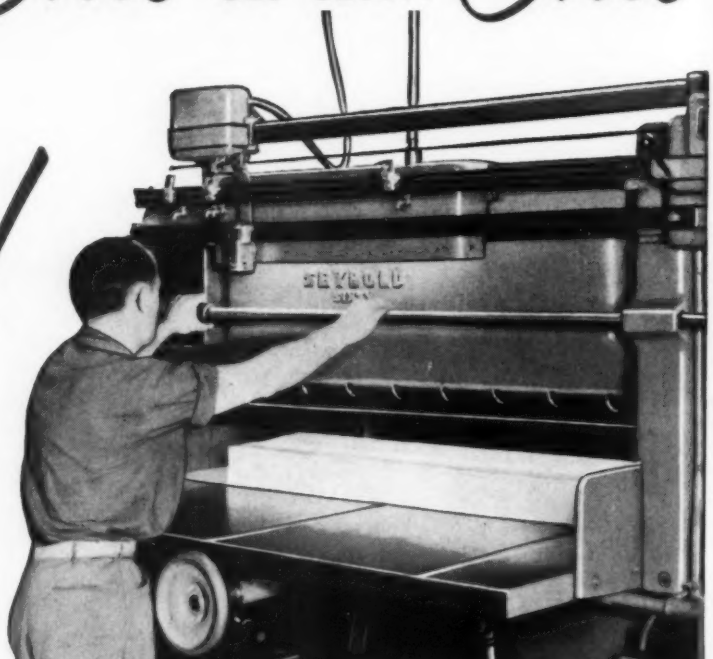


SWENSON
SWENSON EVAPORATOR COMPANY
DIVISION OF WHITING CORPORATION
15653 Lathrop Ave. Harvey, Illinois
Eastern Sales Office and Export Department:
30 Church St., New York 7, N. Y.
In Canada: Whiting Corporation (Canada) Ltd.
47-49 LaPlante Ave., Toronto 2

ON YOUR MARK... *Once* GET SET... *Once*

GO!

TILL THE JOB IS DONE!



It's the constant "starting over again" which makes cutting operations costly . . . the tedious job of positioning the paper for one cut after another.

SEYBOLD has mechanized this tedious job—makes the cutter do the work, not the operator. Once set, the SPACER-TRIMMER starts its routine of cuts automatically, quickly, accurately. No combinations of settings too complicated or too numerous for this machine. Dozens of settings can be carried; each one precise and positive.

Hours of time, tons of spoiled sheets are saved by this SPACER-TRIMMER . . . the lowest cost equipment in your plant. Over its average life, it costs a dollar a day. Ask your SEYBOLD representative for details.

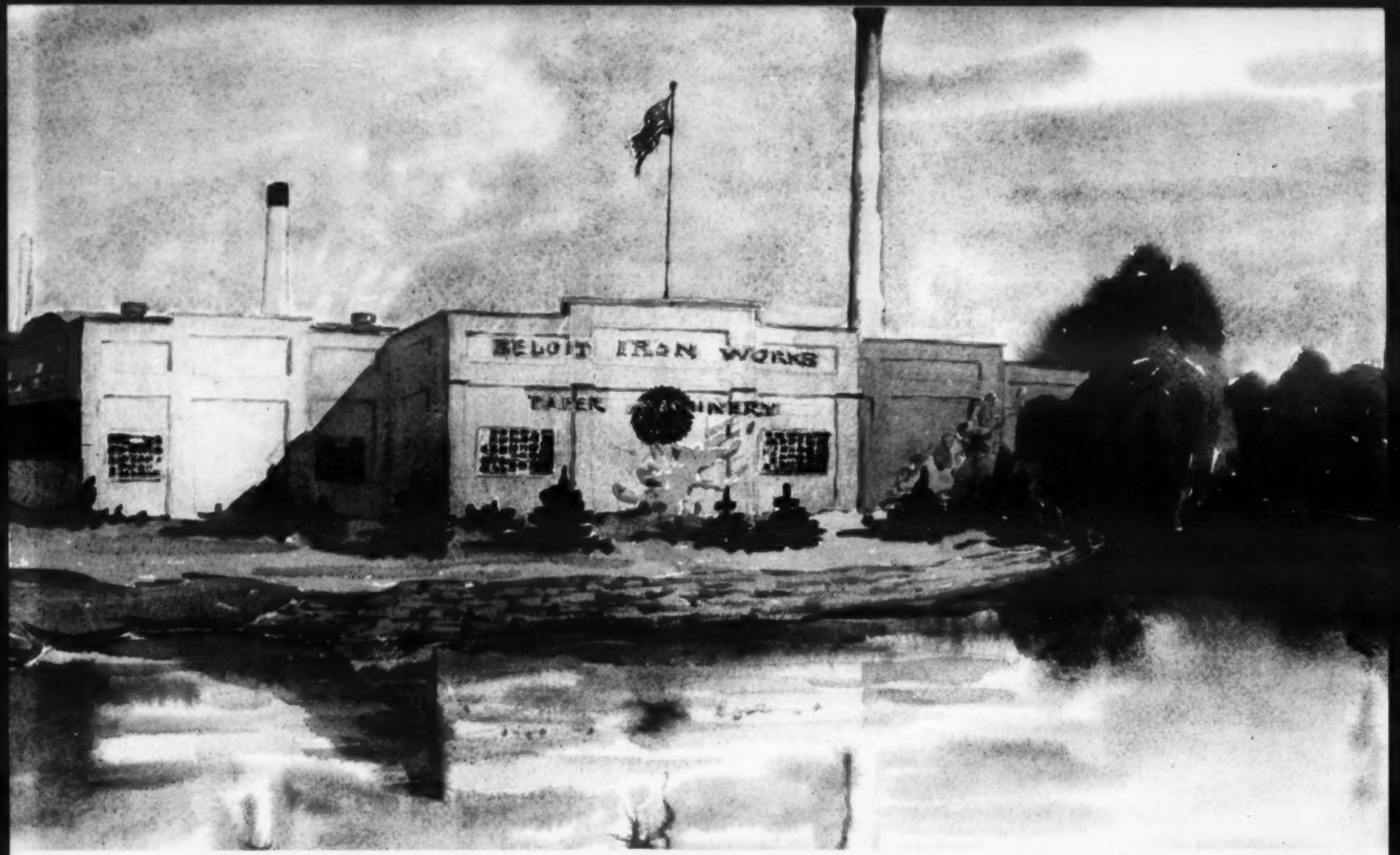
*All Seybold Mill Trimmers have

Z-ACTION

—the exclusive method of putting the knife through the pile.

HARRIS-SEYBOLD

4510 EAST 71st STREET • CLEVELAND 5, OHIO



WATER COLOR PAINTING BY L. J. A. NEESE

Known to paper makers the world over, the big modern plant of Beloit Iron Works at Beloit, Wisconsin, includes over 400,000 square feet devoted exclusively to the manufacture of pulp and paper-making

New Texrope Sheave Gives Lowest Cost

Instant Speed Control

- Covers most speed changing needs from 3 to 20 hp
- Very simple — one sheave does all
- Infinitely variable speed — 100% increase; 2 to 1 range.

THE NEW *Vari-Pitch* AUTOMATIC SHEAVE is the simplest, most economical method of instant speed control ever devised. You just move the motor forward to increase speed and move the motor back to decrease. The *Vari-Pitch* Automatic Sheave changes pitch diameter and holds the belts at proper tension *automatically.*

Now, you can cut unit costs by operating machines at most efficient speed . . . improve quality by compensating for material variation . . . with a very small investment in new equipment. Today, ask your A-C Authorized Dealer or Sales Office to give you complete facts and figures on how the new *Vari-Pitch* Automatic Sheave can save money in your plant. Or write for bulletin 20B7223. A-2767

ALLIS-CHALMERS, 991A SO. 70 ST.
MILWAUKEE, WIS.

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

Sold . . .
Applied . . .
Serviced . . .

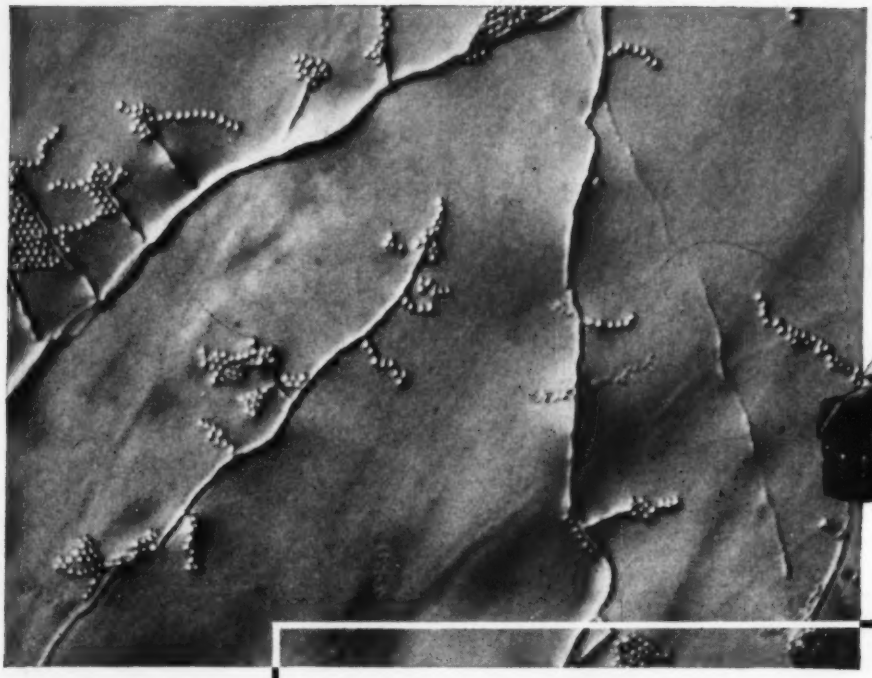
by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.

MOTORS — ½ to 25,000 hp and up. All types.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

PUMPS — Integral motor and coupled types. Sizes and ratings to 2500 GPM.

ALLIS-CHALMERS



Left — Microphoto of Monilia (White), one of the slime-forming micro-organisms frequently found in paper mills and controlled by the Nalco System. Photos in Nalco Laboratories.

FORMULA FOR SUCCESSFUL SLIME CONTROL

SLIME control, like paper making itself, requires constant and careful attention to details. Here is a formula for successful slime control which will cut to a minimum, spots and specks, breaks, cleaning, and other costly problems due to slime:

- Identify slime-forming organisms to be controlled.
  A NALCO SERVICE
- Determine the best types of treatment to be used.
  A NALCO SERVICE
- Locate, by detailed survey, the proper points of application.
  A NALCO SERVICE
- Provide consistent supervision to check application and effectiveness of treatment.
  A NALCO SERVICE
- Maintenance of high standards of sanitation throughout the mill. (Even the best of treating and scientific control can be seriously hampered by unsanitary conditions.)

Nalco Field Representatives and the modern, scientific facilities of the Nalco Laboratories are at your service to put this formula for successful slime control into practical operation in your mill. Write for details today.

NATIONAL ALUMINATE CORPORATION
6232 W. 66th Place • Chicago 38, Illinois

Canadian inquiries should be addressed to Alchem, Limited Burlington, Ontario

THE Nalco SYSTEM

Serving the Paper Industry through Practical Applied Science

THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

An Educational News Magazine

VOLUME 31 - - - - - - - - - - AUGUST, 1949 - - - - - - - - - - NUMBER 5

Published monthly by
FRITZ PUBLICATIONS, INC.

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Published at
404 North Wesley Avenue
Mount Morris, Illinois

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Address all correspondence to
Editorial and Executive Office
59 East Van Buren Street
Chicago 5, Illinois

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Entered as second class matter December 13, 1948, at the post office at Mount Morris, Ill., under the Act of March 3, 1879. Subscriptions in the United States, U. S. Possessions, Canada, and Pan American countries $2.00 for one year, $3.00 for two years. All other countries $3.00 for one year, $5.00 for two years.

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THE PAPER INDUSTRY and PAPER WORLD is indexed regularly in *Engineering Index* and *Industrial Arts Index*. An index to each volume is issued annually by the publisher as Section Two of the April number.

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HORTON

Elevated Tanks

for automatic sprinkler service

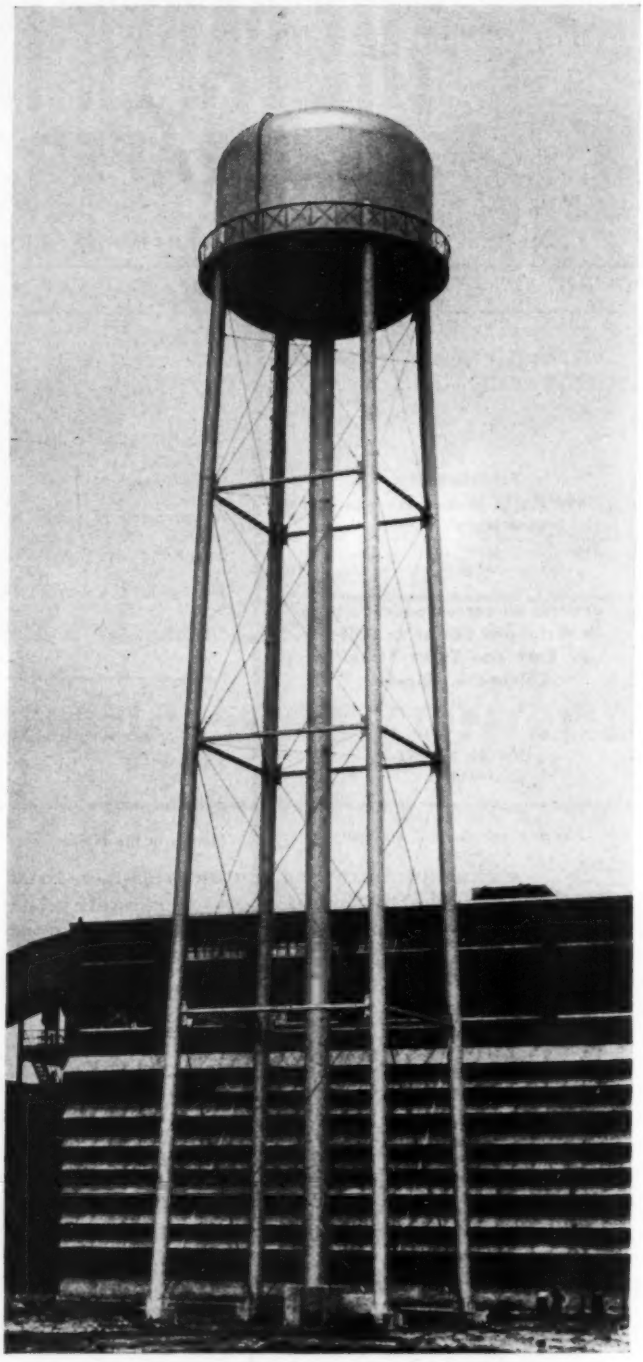
AN automatic sprinkler system will give your plant the best fire protection you can buy, provided the system is backed up by an elevated water tank. Horton welded elevated tanks provide dependable gravity water pressure for sprinkler systems at all times.

Elevated tanks can be used as the primary source of water, or as a secondary source when there is insufficient pressure in the mains to take care of the required load. In either case, you will have plenty of water available the instant a fire breaks out.

Horton ellipsoidal-bottom elevated tanks are built for use with automatic sprinkler systems in capacities from 40,000 to 500,000 gallons. They can be designed for dual service, to provide water for both general use and fire protection. When this is done, the piping connections are arranged to hold a specified amount of water for fire protection in reserve. If you're planning to install an elevated water tank, write our nearest office outlining your requirements.

WELDED ELLIPSOIDAL-BOTTOM TANKS

Capacity U.S. Gallons	Tank Dimensions			
	Diam.	Shell Height	Depth in Roof and Bottom	Range
50,000	22'0"	11'0"	4'0"	19'0"
80,000	24'0"	11'0"	4'0"	18'0"
75,000	26'0"	11'0"	5'0"	21'0"
100,000	28'0"	14'0"	5'0"	24'0"
125,000	30'0"	18'0"	5'0"	25'0"
150,000	32'0"	15'0"	6'0"	27'0"
200,000	36'0"	16'0"	6'0"	28'0"
250,000	40'0"	15'0"	7'0"	29'0"
300,000	42'0"	17'0"	7'0"	31'0"
400,000	46'0"	19'0"	7'0"	34'0"
500,000	50'0"	19'0"	9'0"	37'0"



This 100,000-gal. Horton elevated tank is located at the Southern Paperboard plant at Port Wentworth, Ga. It is an all-welded structure, 125 ft. to bottom, and is used to provide gravity water pressure for automatic sprinkler service.

CHICAGO BRIDGE & IRON COMPANY

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San Francisco, 11.....1217—22 Battery Street Building
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at last... a new, *profitable* way to

COMBAT

THE BLACK MENACE OF

STREAM POLLUTION!

Fulton Iron Works Company has developed a unique method of minimizing pollution problems—and saving chemicals, water, labor and power at the same time!

WHAT IT IS: The new Fulton Fibre Press is a highly-efficient machine that concentrates your black liquors to a greater degree than ever before possible.

WHAT IT OFFERS YOU:

1—easier waste control methods
2—cheaper and greater chemical recovery
3—up to 75% *reduction* in effluents
4—less need for handling equipment
5—lower wash water demands
6—continuous operation

If you process *any* form of pulp, investigate the

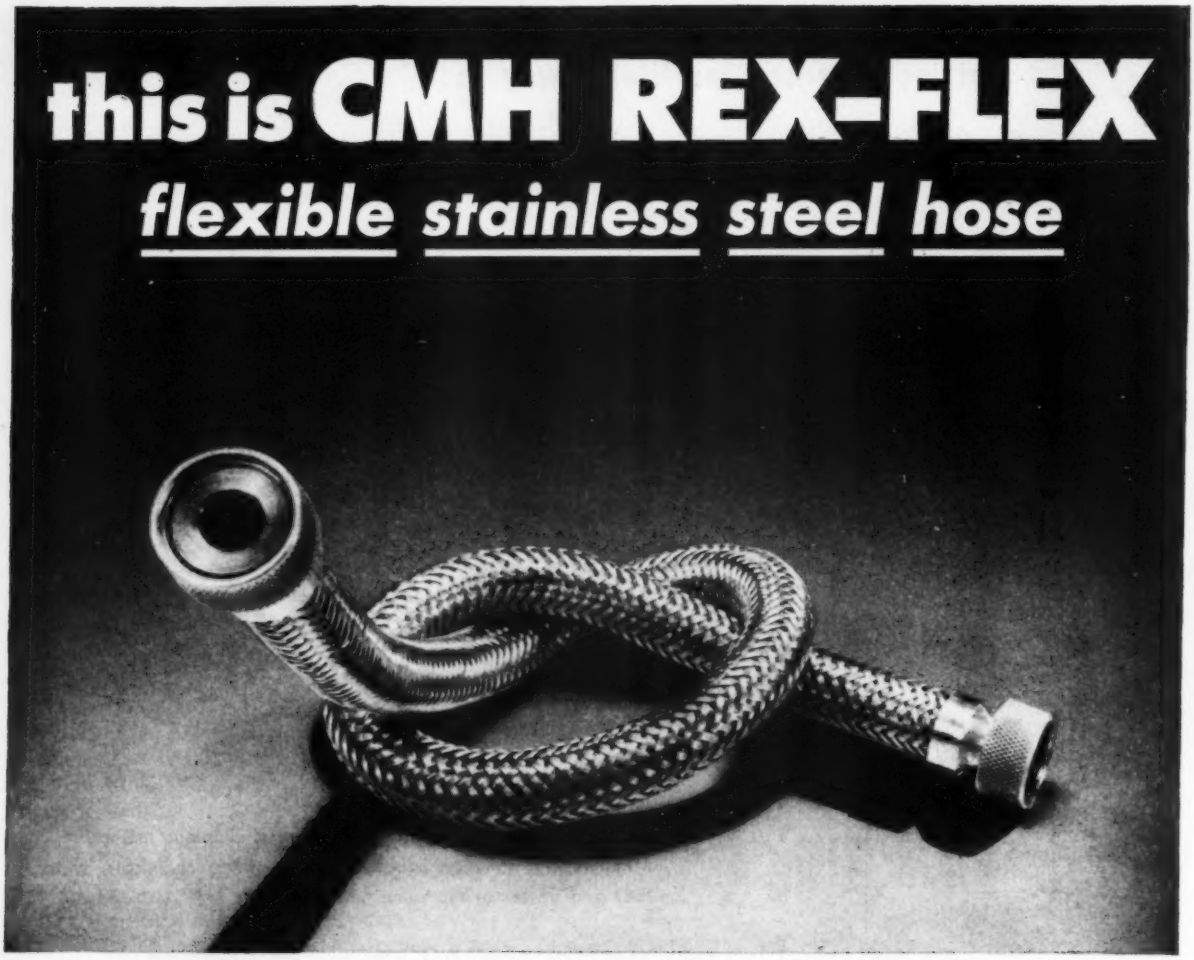
FULTON FIBRE PRESS ...the "money-savingest" machine you can put in your mill!

A FULTON Fibre Press at our plant is at your disposal—*without obligation*—for testing its cost-saving and quality-improving features. For full details, phone, wire or write:

FULTON IRON WORKS COMPANY
SAINT LOUIS 14, MISSOURI
New York Office: 82 Wall Street, New York 5
MAKERS OF FINE PROCESSING AND EXTRACTION EQUIPMENT SINCE 1852

this is CMH REX-FLEX

flexible stainless steel hose



While the need rarely arises, tying CMH REX-FLEX into a knot does illustrate the high degree of flexibility of this *all-metal* corrugated stainless steel hose. And the same characteristics of stainless steel that make REX-FLEX so flexible also give it the ability to withstand extreme cycles of vibration, flexation and variplane motions.

Light in weight...high in strength... leak-proof . . . and highly resistant to corrosion, REX-FLEX is the answer to the problems of handling searching and corrosive liquids and gases where there is motion.

CMH REX-FLEX is made in sizes from 5/16" through 6" I.D. Available with helical or annular corrugations, with or without metal braid covering. Ends may be flanged or equipped with fittings to meet your requirements. Write for complete information.

CMH—ONE dependable source
for every flexible metal hose requirement

• CMH manufactures all standard types of flexible metal hose, both convaluted and corrugated, in a variety of metals; expansion joints for piping systems; stainless steel and brass bellows; various conduits and special assemblies of these components.

CHICAGO METAL HOSE CORPORATION

CMH

Leaders in the Science of Flexonics
MAYWOOD, ILLINOIS
Plants at Maywood, Elgin and Rock Falls, Illinois
In Canada: Canadian Metal Hose Co., Ltd., Brampton, Ontario

FLEXON . . . . . identifies CMH products which have served industry for more than 47 years.

VESSEL DIVISION

NEWS

75th ANNIVERSARY 1876 · 1949

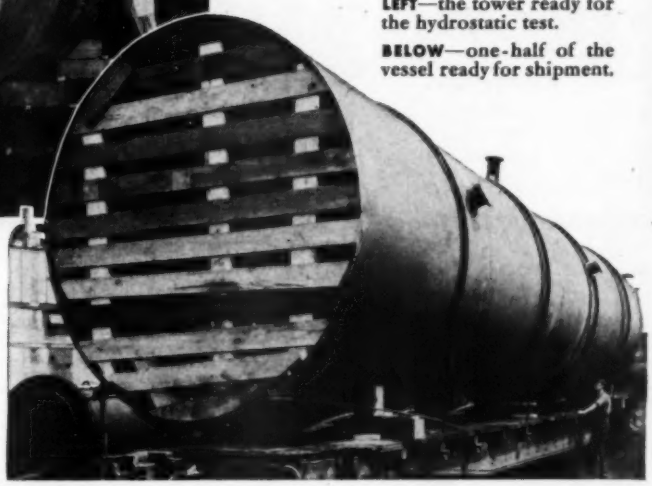
A. O. SMITH Corporation

New York 17 · Philadelphia 3 · Pittsburgh 19 · Atlanta 3 · Chicago 4
Tulsa 3 · Dallas 1 · Houston 2 · Seattle 1 · Los Angeles 14
International Division: Milwaukee 1

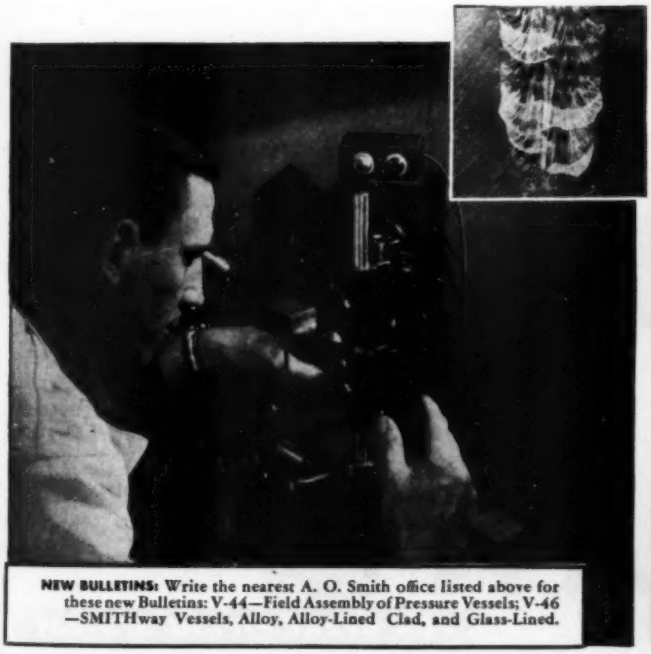
A. O. SMITH TAKES THE GUESS WORK OUT OF FIELD ASSEMBLY. Railroad shipping restrictions made it necessary to field-assemble this 11½ ft. dia. x 116 ft. long SMITHlined Fractionating Tower. To insure ease of assembly in the field, it was first manufactured and completely assembled in the A. O. Smith Milwaukee Plant, then hydrostatically tested, cut in two at the center girth seam, rescarfed for welding in the field, and shipped. Field-assembly costs were cut to a minimum with only one girth seam to be welded.

LEFT—the tower ready for the hydrostatic test.

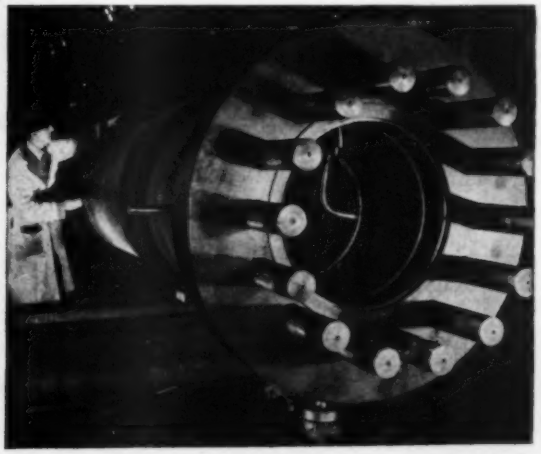
BELOW—one-half of the vessel ready for shipment.



MANY TESTS BEYOND CODE REQUIREMENTS are a regular part of A. O. Smith vessel production control procedures. Here Bill Poehlman, a 20-year veteran, in charge of spectroscopy and X-Ray research, checks the deposited weld metal composition in a vessel test plate, by means of an A. O. Smith-developed microspectrographic technique.



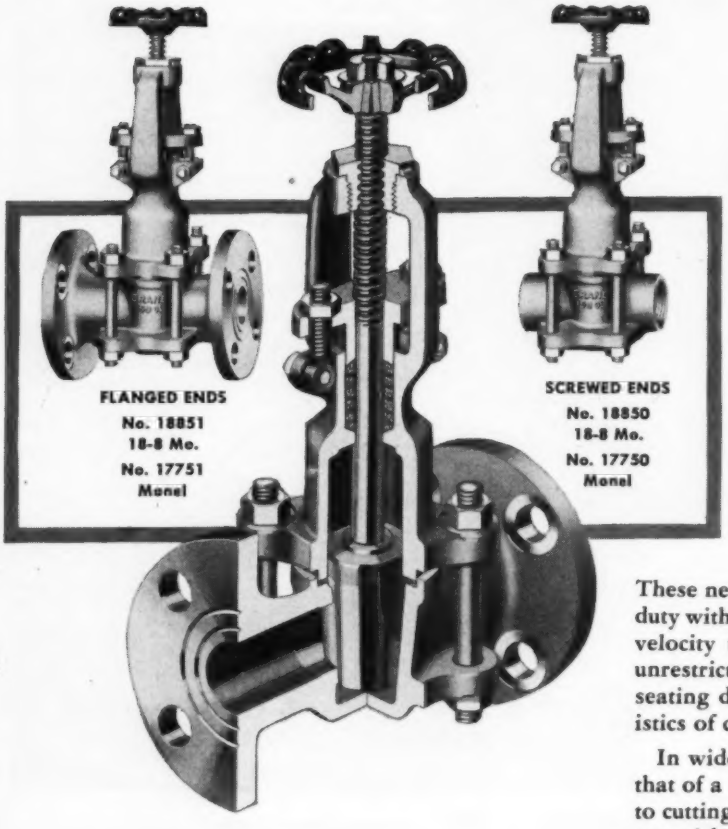
IN STOCKHOLM, SWEDEN, they know about the famous SMITHway welded Multi-Layer vessel construction. Here is one of two SMITHway Inconel-lined Multi-Layer Autoclaves for fatty acid service, with a shell thickness of 5 inches and an operating pressure of over 5,000 psi. This vessel was shipped direct by ocean-going ship from Milwaukee to Stockholm.



NEW BULLETINS: Write the nearest A. O. Smith office listed above for these new Bulletins: V-44—Field Assembly of Pressure Vessels; V-46—SMITHway Vessels, Alloy, Alloy-Lined Clad, and Glass-Lined.

Another Standout—

in the CRANE Corrosion-Resistant Line



Double Duty Plug Gate Valves

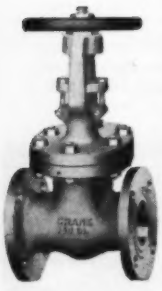
IN 18-8 MO OR MONEL

WORKING PRESSURE:
150 pounds, gas or liquid

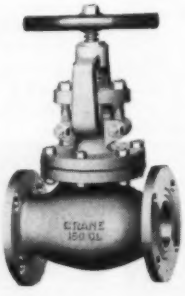
Sizes: ½ to 2 in.
Flanged or screwed ends

These new Crane Plug Gate Valves perform double duty with equal efficiency—as globes, for high or low velocity throttling—as gates, for straight-through, unrestricted flow. Their unique circular plug disc and seating design combines the best service characteristics of conventional gate and globe valves.

In wide-open position, flow discharge is equal to that of a wedge gate valve. In throttling, resistance to cutting equals that of plug type globes. They will not stick even when closed while hot, opened when cold. Galling is eliminated.



IN SIZES 2½ TO 6 IN.
Crane offers a companion line of corrosion-resistant gates and globes. Working pressure: 150 pounds, liquid or gas. Made in all 18-8 Mo or all Monel. Flanged ends. Swing check valves available in sizes ½ to 6 inches.



In addition to dual-purpose utility, these valves offer famous Crane Quality in construction and materials. All parts in contact with flow are 18-8 Mo or Monel, the most versatile of common corrosion-resistant alloys. Ask your Crane man about these Plug Gates, or **write for Catalog No. 320,** describing them fully.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

EVERYTHING FROM . . .

VALVES
FITTINGS
PIPE

CRANE

PLUMBING
AND
HEATING

FOR EVERY PIPING SYSTEM

NOW AVAILABLE! YOURS FREE!

● *For Research Laboratories*

● *For Manufacturing Control Laboratories*

● *For Production Requiring Quality Chemicals*

● *For Educational Laboratories*

● *For Process Planning and Development*

...A Complete Guide for Buyers in the Selection of BAKER & ADAMSON REAGENTS and FINE CHEMICALS

Here it is—Baker & Adamson's new, profusely illustrated catalog! It contains 226 pages of clear, concise information on 1,000 laboratory reagents and fine chemicals, including such pertinent data as grades, strengths, maximum limits of impurities, packaging, etc.

New features include special comments on products with outstanding high purity, unusual physical or chemical characteristics, processing techniques, packaging, etc. which are not evident in specification data alone.

This valuable book also contains full data on B&A's outstanding packages . . . features that are not to be found anywhere else. Gives just the type of information you want on the new B&A "PBL" Drum, the "Saftepak," the 6½ gal. carboy, 9-bottle case, etc.

Get your copy of this new catalog; there is no obligation. Fill out coupon, attach to your business letterhead and mail today.

BAKER & ADAMSON PRODUCTS, General Chemical Division
Allied Chemical & Dye Corporation
40 Rector Street, New York 6, N. Y.

Please send me, with no obligation on my part, your new 226-page catalog of Baker & Adamson Reagents and Fine Chemicals.

*Name*_____

*Organization*_____ *Position*_____

*Address*_____

*City*_____ *State*_____ 16-8

Keeping the Navy "*Ship Shape*" with the Dempster-Dumpster . .

Shipyards, stations, and the men in Uncle Sam's Navy set a standard of cleanliness that is unsurpassed. Helping to maintain this high standard of Navy cleanliness is the Dempster-Dumpster System of materials handling . . . a system of quick pick-up of preloaded containers for hauling, dumping or moving materials.

Exactly 10 years ago the Navy purchased its first Dempster-Dumpster equipment . . . one truck hoisting unit with several containers. Now there are dozens of hoisting units and thousands of Dempster-Dumpster containers of many types at work keeping Navy yards and stations "ship shape." The sturdy steel foolproof and fireproof containers are placed at various places, such as barracks, mess halls, the docks and ship yards, wherever materials (solids or liquids) need be deposited immediately as they accumulate. A Dempster-Dumpster truck hoisting unit quickly picks-up each container when it is filled and hauls it to the disposal area. Contents are automatically dumped and container returned.

If you have a materials handling problem demanding more cleanliness, more economy, and more efficiency, it will pay you to investigate the Dempster-Dumpster System—popularly used, not only by the armed forces, but by municipalities, leading industrial plants, and by large and small institutions of all kinds.

Photo above shows eleven hoisting units recently delivered to the U. S. Navy. Various types of containers are shown in carrying positions. Photo at left shows a hoisting unit preparing to lift a 10 cu. yd. Flat Top container, while another hoisting unit is dumping a 9 cu. yd. Trash and Rubbish Kolector type container. All controls of unit are conveniently located at the driver's seat. One driver and one truck handles any number of containers regardless of types.

DEMPSTER BROTHERS INC.

789 Dempster Bldg.
Knoxville 17, Tennessee

BRIGHTER WHITE PAPERS

Mean More and Happier Customers

White paper manufacturers can improve their profit position by using higher percentages of short fibre pulps, i.e., more soda and less sulphite and sulphate. Sutherlands refine this cheaper furnish so much better that sheet brightness increases, formation improves, smoothness becomes greater (less super-calendering), and strength becomes higher—all this at increased speeds. And with greatly reduced power consumption and maintenance of stock preparation equipment.... Remember, Sutherlands develop the fibre strength without destroying the fibre length, thus producing a faster draining pulp. This means more money for you in higher production and more satisfied customers due to higher quality.... You'd be surprised at how fast Sutherlands pay for themselves. May we show you?

SUTHERLAND REFINER CORPORATION · **TRENTON, NEW JERSEY**

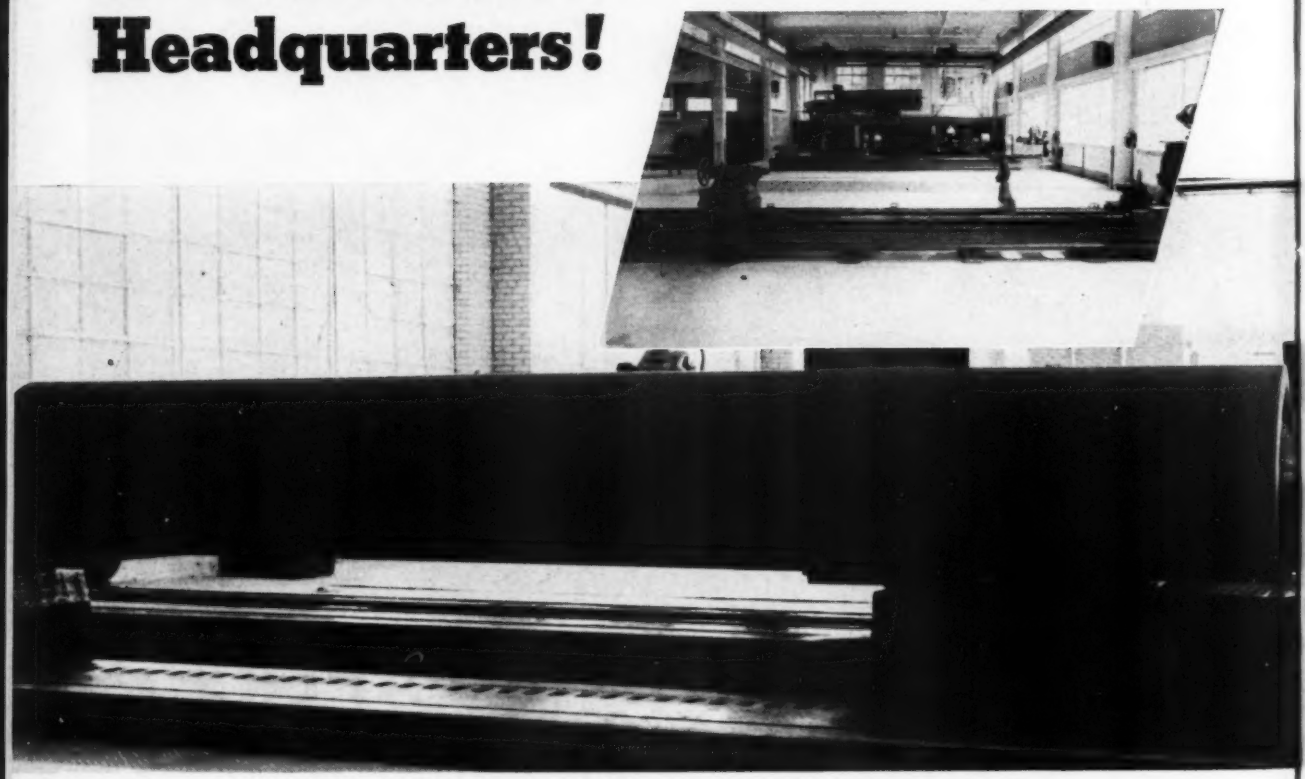
Manufactured in the United States by Valley Iron Works Co., Appleton, Wisconsin

Sutherland Refiner Ltd., Windsor Hotel, Montreal, P. Q.

There's a NEW LOOK at Rubber Roll Headquarters!

Above: Exterior of new Ward plant addition at Stowe-Woodward, Inc.

Below: A section of the interior looking toward elevated loading platform Farrel Grinder in rear, lathes in foreground, vulcanizers at left.



New 42′ 3″ Farrel Rubber Roll Grinder, LARGEST AND LONGEST OF ITS TYPE IN THE U.S.A.

You're looking at Stowe-Woodward's new Ward plant addition . . . built and equipped for the single purpose of making the finest rubber covered rolls to your most exacting requirements. Here you will find the tools, the will, and the skill that have justly made Stowe-Woodward the place to turn when quality is basic, service is urgent, or a new rubber roll development must be pioneered.

Typical of the new equipment is the Farrel Roll Grinder which will grind and crown rubber rolls 60″ diameter by over 300″ width of face with tolerances held to .0005″. This grinder and other new facilities symbolize our determination to serve you even better in the days ahead.

STOWE-WOODWARD, INC.

Craftsmen in rubber

NEWTON UPPER FALLS 64, MASSACHUSETTS

1. KIND OF STEEL
2. METHOD OF MANUFACTURE
3. CHEMICAL COMPOSITION
4. CHECK ANALYSIS
5. FLARING TEST
6. HARDNESS TEST
7. HYDROSTATIC TEST
8. SPECIMENS
9. NUMBER OF TESTS
10. RETESTS
11. RETREATMENTS
12. PERMISSIBLE VARIATIONS IN DIMENSIONS
13. FINISH
14. MARKING
15. INSPECTION

How to be sure about your evaporator tubes ON ALL THESE 15 COUNTS

YOU don't need to guess about quality when you buy black liquor evaporator tubes. The Timken® 5% nickel tube specifications cover all the 15 points listed above—and more. We show you what you get, and *guarantee* you'll get it!

Timken 5% nickel tube specifications have been used by leading pulp mill operators for many years. Timken tubing made to these specifications will help you cut the cost of black liquor corrosion by 1) reducing downtime, 2) lowering tube replacement costs, and 3) minimizing tube sheet wear. You're sure of maximum tube life per dollar invested.

If you want to know what you're getting when you buy your next evaporator tubes, write today for your copy of Timken Specifications for 5% nickel tubes. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

50th birthday of the company whose products you know by the trade-mark: TIMKEN

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

Which of These 46 Pumping Jobs Can the "PW" Pump Do For You?

GROUNDWOOD PULP PROCESS

Grinder Shower	Whitewater
Bull Screen to Flat Screen	½-1% Stock
Flat Screen to Decker	½-1% Stock
Flat Screen Shower	Whitewater
Decker Chest to Beaters	*3-5% Stock
Decker Shower	Whitewater
Decker Chest to Wet Machine	1-3% Stock
Mill Supply	Water

SULPHITE PULP PROCESS (ACID)

Acid to Digester	Acid
Digester Circulating	Acid
Blow Pit to Knotters	1-3% Stock
Knotter Shower	Whitewater
Knotter to Fine Screen	1-2% Stock
Fine Screen Showers	Whitewater
Screened Stock to Deckers	1-2% Stock
Decker Showers	Whitewater
Decker Chest to Beaters	*3-5% Stock
Decker Stock to Wet Machine	2-3% Stock
Tailings from Fine Screens	1-3% Stock
Bleach Liquor to Bleachers	Caustic
Decker Stock to Bleachers	*4-5% Stock
Bleach Stock to Washers	2-4% Stock
Chlorinated Stock to Washers	2-3% Stock
Mill Supply	Water

SULPHATE STOCK PROCESS

White Liquor to Digester	Caustic
Digester Circulating	Caustic
Diffuser Stock to Knotters	1-4% Stock
Knotter Showers	Whitewater
Stock to Fine Screens	1-2% Stock
Fine Screen Showers	Whitewater
Screened Stock to Deckers	1-2% Stock
Decker Showers	Whitewater
Decker Stock to Beaters	*3-5% Stock
Decker Stock to Wet Machine	2-3% Stock
Black Liquor to Storage	Black Liquor
Black Liquor to Evaporators	Black Liquor
Concentrated Black Liquor	Black Liquor
Green Liquor	Green Liquor
Mill Supply	Water

PAPER MILL

Beater Stock to Jordans	2-4% Stock
Jordan Stock to Vor-trap	1-2% Stock
Machine Stock to Head Box	3-4% Stock
Fan Pump	.025-.9% Stock
Machine Showers	Whitewater
Whitewater Removal	Whitewater
Mill Supply	Water

*Handles consistences to 8% bone dry with *Hi-Density* Feeder (multiple vane mechanism for moving pulp into pump suction).

In Materials to Pump Your Toughest Corrosives!

DEVELOPED SPECIFICALLY for heavy-duty requirements of stock pumping. Only four working parts — construction of cast iron, Ni-Resist or stainless steel with combinations of the three materials fitted to meet special applications.

Entire rotating assembly can be removed without disturbing suction or discharge piping. Interchangeable parts within different size pumps reduces parts inventories. Eight sizes with capacities 175 to 8000 gpm; heads to 140 ft. Write for Bulletin 08B7112.

ALLIS-CHALMERS, 991A SO. 70 ST. A-2783
MILWAUKEE, WIS.

Hi-Density is an Allis-Chalmers trademark.

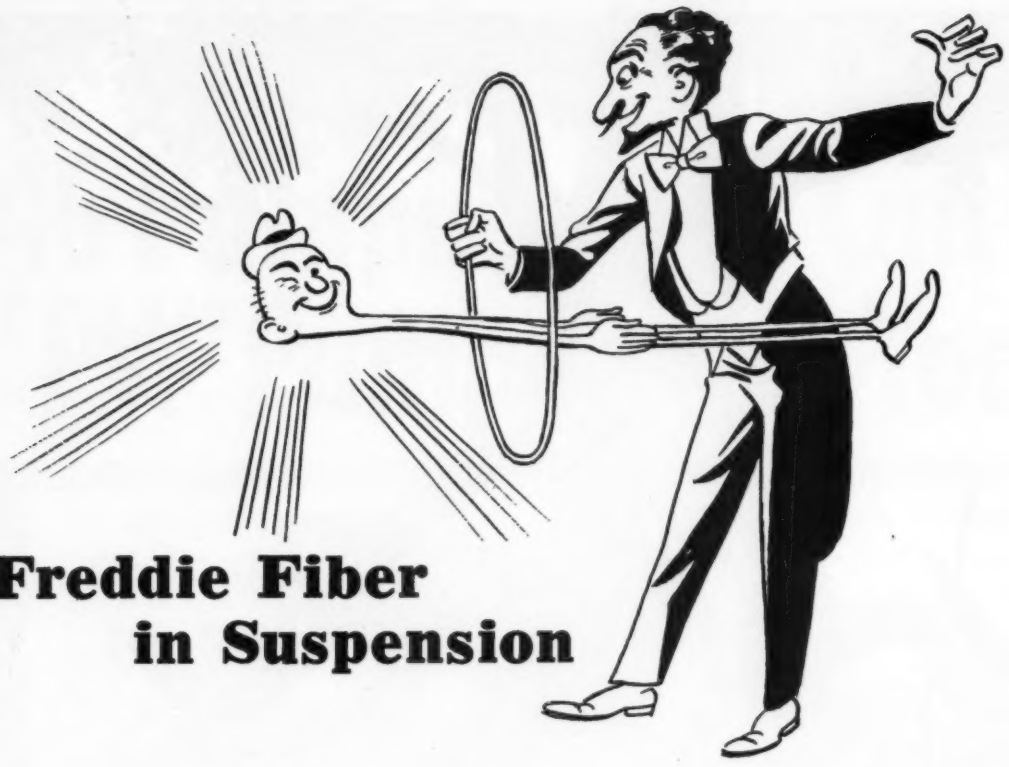
ALLIS-CHALMERS

NO!!!... we don't mean that the various labor saving devices found in Downingtown machinery will give your mill hands "time to bum," but they will have more time to do other things, because of the many new labor saving features found only in Downingtown Fourdrinier, Cylinder, Wet and Wallboard Forming Machines and other individual units . . . Aside from the major labor saving features in each machine, you'll find many post-war improvements in design and construction. Many of these "thoughtful improvements" may not even show in our specifications or general drawings . . . But your men will see and appreciate them when they operate the machine . . . and, if they don't say it, they'll think to themselves "the man who designed this, or thought of that, had the papermaker in mind." These are the extras you get from Downingtown, that are "not extras in our quotations," but they, plus the major labor saving advantages, all add up to EASE OF OPERATION . . . Call us and, when you order, remember, "you'll get more," in *Thoughtful "Papermill-Wise" Engineering.*

DOWNINGTOWN MANUFACTURING COMPANY

DOWNINGTOWN, PA.

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880



Freddie Fiber in Suspension

ALWAYS remember that it is just as important to keep "Freddie Fiber" in suspension as it is to work on him in HYDRAFINERS and jordans or to deliver him properly to mold or wire.

Do you have inadequate agitation? Then do something about it. Check your chest design. Check the mechanism.

Shartle Agi-Flo agitation — Shartle propeller agitation. Each has its place. Both are engineered to keep "Freddie" in suspension and the management agitation-happy.

ADDRESS SHARTLE FOR PARTICULARS.

SHARTLE PROPELLER

SHARTLE BROS.

MIDDLETOWN, OHIO

DILTS MACHINE WORKS, FULTON, NEW YORK
Divisions of
THE BLACK-CLAWSON COMPANY, HAMILTON, OHIO
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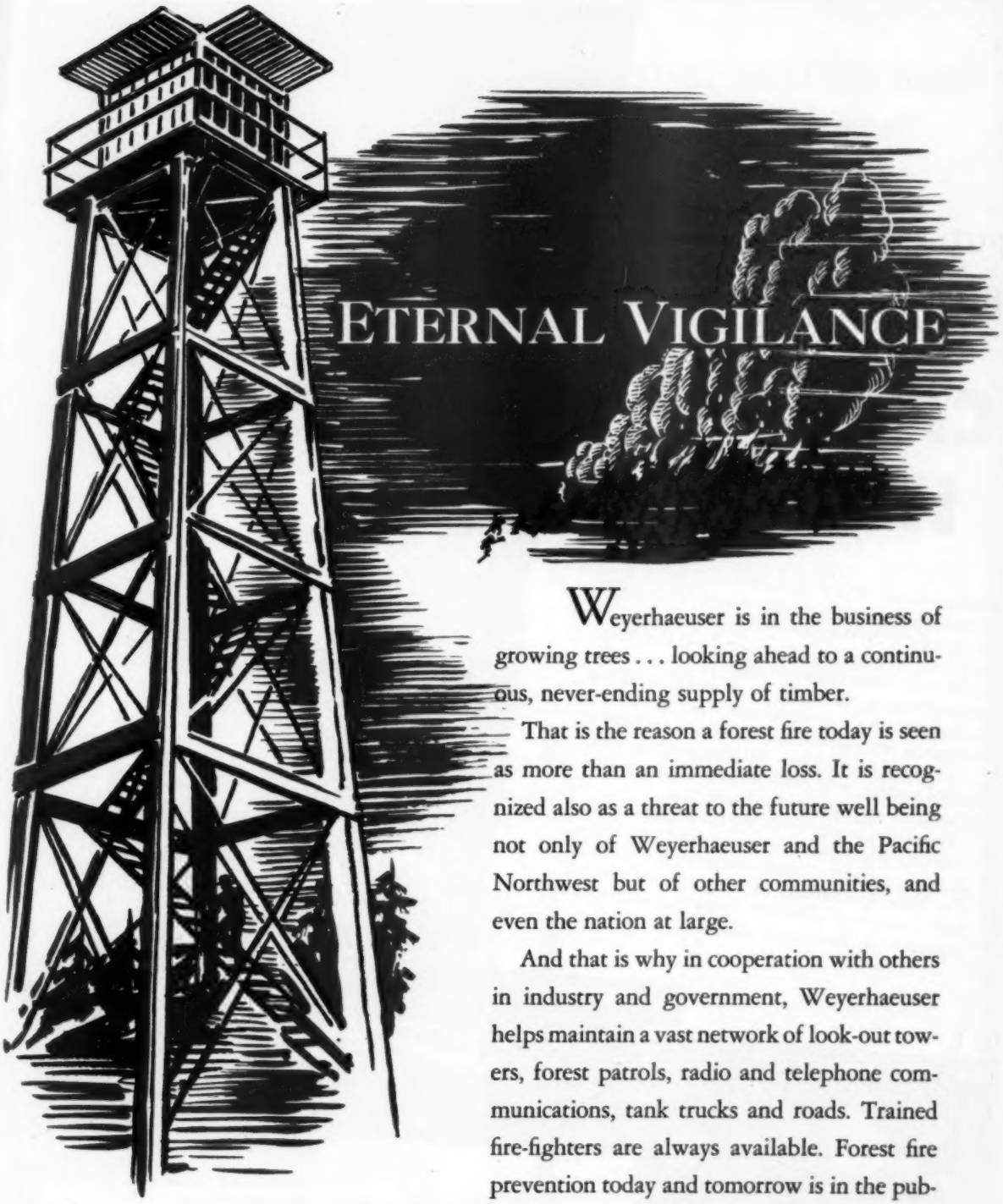
AGI-FLO PUMP

KOHLER SYSTEM EQUIPMENT
•
PRODUCT OF DILTS



ETERNAL VIGILANCE

Weyerhaeuser is in the business of growing trees . . . looking ahead to a continuous, never-ending supply of timber.

That is the reason a forest fire today is seen as more than an immediate loss. It is recognized also as a threat to the future well being not only of Weyerhaeuser and the Pacific Northwest but of other communities, and even the nation at large.

And that is why in cooperation with others in industry and government, Weyerhaeuser helps maintain a vast network of look-out towers, forest patrols, radio and telephone communications, tank trucks and roads. Trained fire-fighters are always available. Forest fire prevention today and tomorrow is in the public interest for the present and the future.

YES! GO WEST!

1949 Fall Meeting TAPPI—Portland, Oregon

PULP DIVISION

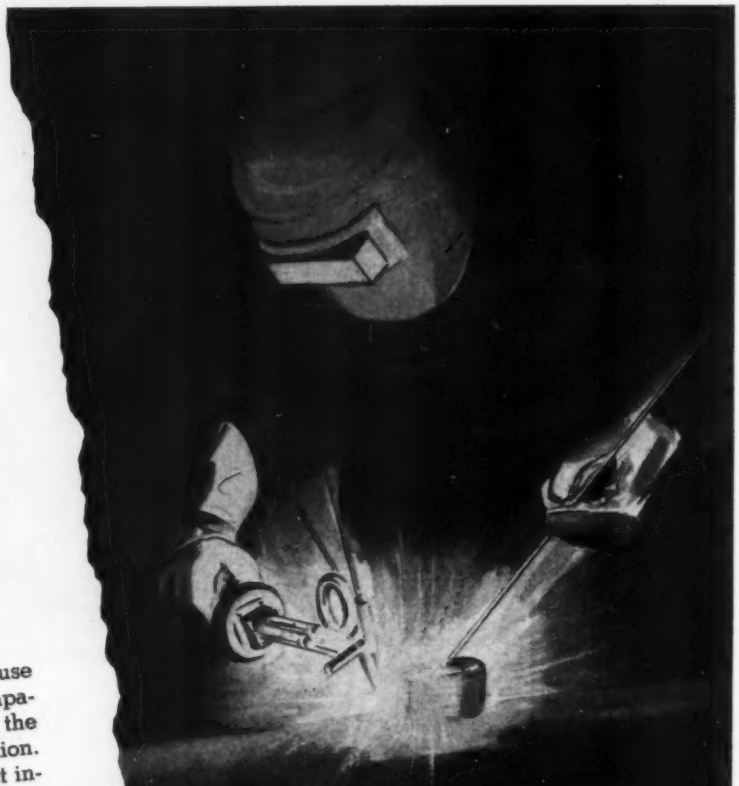
WEYERHAEUSER

PUT YOUR COMPLETE
POWER PIPING JOB
IN
CAPABLE HANDS

Prefabrication is the accepted method to use on today's power piping job. And it takes capable hands to do the job—every step along the way from engineering through field erection.

Efficient prefabrication requires correct interpretation of blueprints . . . careful detailing to coordinate shop work with field work . . . complete shop facilities and trained craftsmen . . . highly specialized metallurgical control, model testing, and other accepted test procedures . . . and expert field erection.

Equally important—it requires long and diversified practical experience with all types of high pressure, high temperature piping. We have specialized in this field for almost half a century. Ask our nearest field representative for additional information.



Pittsburgh Piping
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How DUPONT ALATHON TRADE MARK helps win sales for coated paper products

"ALATHON" POLYTHENE RESINS make paper resistant to many materials

Now—acids, alkalis, solvents, fertilizers, vegetable oils . . . these and many more can be safely packaged in paper coated with new Du Pont "Alathon" Polythene Resins. Also ideal for food packages and hot drink cups. "Alathon" gives paper a tough, glossy, tasteless, odorless, non-toxic surface that remains flexible at low temperatures . . . provides excellent moisture protection. Every one of these features is a sales point you can use to create a preference for your paper products.

"ALATHON" POLYTHENE RESINS give a better appearance to paper products

Paper coated with "Alathon" has much greater sales appeal—longer shelf life, freedom from blocking and better all-round protective qualities. "Alathon" gives paper products lacquer-brilliant finishes . . . helps them look fresh and new for a longer period. Several grades available—you can choose the right one for your needs.

WRITE TODAY for new booklet—"Du Pont 'Alathon' Resins." Contains thirty-one pages of facts and information about these new paper-coating materials. Gives properties and many suggested applications. Du Pont will be glad to work with you on applications in your plant.

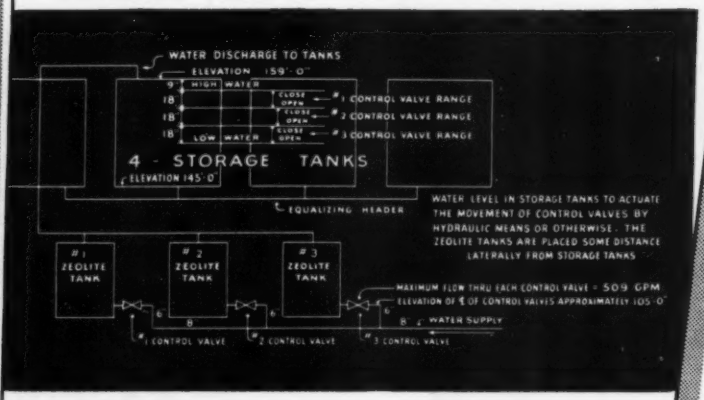
AMMONIA DEPARTMENT
E. I. du Pont de Nemours & Co. (Inc.)
Wilmington 98, Delaware

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •


WATER DISCHARGE TO TANKS
ELEVATION 159'-0"
HIGH WATER
LOW WATER
#1 CONTROL VALVE RANGE
#2 CONTROL VALVE RANGE
#3 CONTROL VALVE RANGE
CLOSE
OPEN
4 - STORAGE TANKS
ELEVATION 145'-0"
EQUALIZING HEADER
WATER LEVEL IN STORAGE TANKS TO ACTUATE THE MOVEMENT OF CONTROL VALVES BY HYDRAULIC MEANS OR OTHERWISE. THE ZEOLITE TANKS ARE PLACED SOME DISTANCE LATERALLY FROM STORAGE TANKS
#1 ZEOLITE TANK
#2 ZEOLITE TANK
#3 ZEOLITE TANK
MAXIMUM FLOW THRU EACH CONTROL VALVE = 509 GPM
ELEVATION OF 3 OF CONTROL VALVES APPROXIMATELY 105'-0"
WATER SUPPLY
#1 CONTROL VALVE
#2 CONTROL VALVE
#3 CONTROL VALVE

Automatic Control of Treated Water

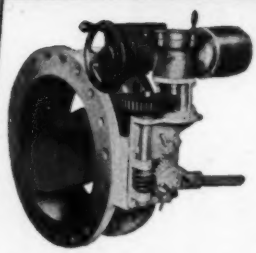
In the above installation, float switches control the three electric motor operated slow acting R-S Valves which maintain a constant supply of treated water in the four storage tanks. The result is simplified performance, minimum pressure drop, unexcelled flow characteristics and reduced maintenance.

Similar applications of power operated R-S Valves can be equipped with air diaphragm, oil or hydraulic cylinders for the control and shut-off of a multitude of materials. They are used advantageously to reduce, regulate and shut off pressure whether above or below atmosphere; to control liquid level; to relieve and control back pressure; to maintain a constant differential pressure; to control rate of flow; to control combustion, and govern the output of pumps, fans, engines and turbines.

R-S Valves are precision engineered, metallurgically and mechanically. Adapted to elevated or sub-zero temperatures . . . 15 to 900 psi.

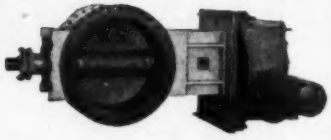
Consult with your local R-S representative. Look for the address and phone number listed under "R-S Products Corporation, Valves" or write direct.

R-S PRODUCTS CORPORATION
Wayne Junction • Philadelphia 44, Pa.



No. 617. Float Switch Electric Motor Control for slow acting R-S Valve. Hand wheel for manual operation on gear reduction drive. Extended lever for operating sister valve in parallel line.

No. 726. 30-inch R-S Heavy Duty Valve with 125-pound American Standard flanges, steel diaphragm top and positioner, hand wheel control with declutching mechanism and outboard gooseneck bearing on operating shaft.

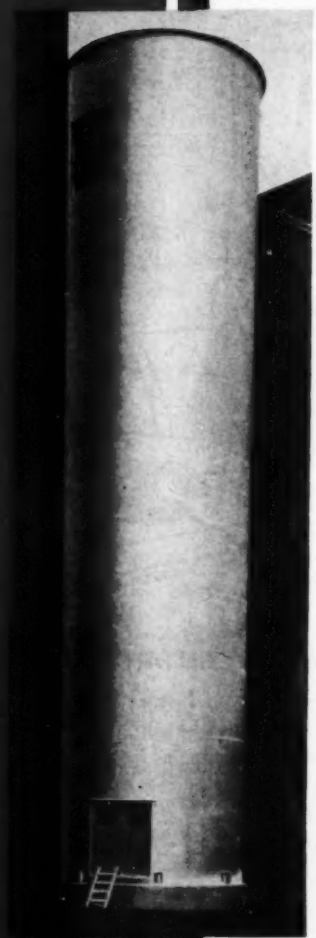


No. 658. 42-inch R-S Heavy Duty "H" Metal 125-pound Valve for high pressure and flow. Opens or closes completely in one second requiring 38,000 pounds torque.

No.755.R-SPipeLine Shock Absorbers (four models) eliminate shock and hammering in pipe lines carrying liquids of any nature. No moving parts . . . easily installed in any position.

for . . . **$AFE TORAGE** *with* **AVINGS . . .**

Get A Posey Bid!

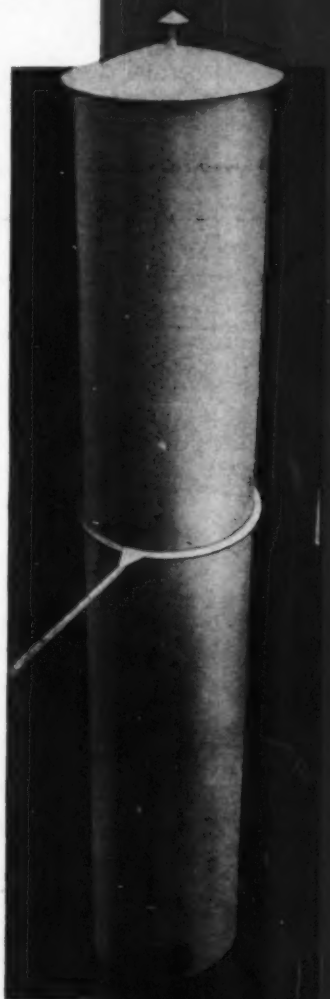


Smart equipment buyers never buy "a tank." They buy safe storage, and there's a lot more to safe storage than meets the eye . . . whether you're looking at a blueprint or at the finished hollow steel cylinder.

Because they know this, more and more paper mill executives and superintendents turn to Posey when they need storage equipment. Posey not only provides safe storage . . . *but often provides it at a saving.*

For experience gained in almost 40 years of tank fabrication, has taught Posey how to eliminate needless, expensive fumbling and unnecessary operations. But savings are never affected at the expense of tank integrity. Stresses are always properly relieved. All plate edges are properly prepared for welding. Both longitudinal and round-about seams are precision welded. Steel plate is pickled and painted to resist weather and corrosion.

For economy consistent with safety, ask Posey to bid.



ESTABLISHED SINCE 1910

NEW YORK OFFICE: GRAYBAR BUILDING

POSEY IRON WORKS, INC.

formerly **LANCASTER IRON WORKS, INC.**

LANCASTER, PA. U.S.A.

DIVISIONS: STEEL PLATE • ASPHALT • STEEL FORM • BRICK MACHINERY

"Why doesn't our company do like other companies?"

If you haven't yet installed a Payroll Savings Plan in your company, you can be pretty sure some of your employees are asking that question. For workers *like* this easy, automatic way of investing in U. S. Savings Bonds—and more than 20,000 large companies have made this convenience available to the people on their payrolls.

WHAT GOOD IS "PAYROLL SAVINGS"?

The Payroll Savings Plan is the *only* means by which people can obtain Bonds automatically on the installment plan. It pays off in many ways: increased security for the individual, who gets back $4 for every $3 when the Bonds mature; company benefits due to improved worker morale —a reduction of absenteeism, labor turnover, and accidents; increased national security, because Bond sales spread the national debt.

HOW MANY CAN AFFORD BONDS?

Deductions for taxes and other purposes which reduce take-home pay should not be confused with allotments for Bonds, which are taken home as *interest-paying savings*. Of course, the cost of living makes it tough for some people to buy Bonds. But nation-wide experience indicates that 40-60% of the employees in any company can be persuaded to sign up for Payroll Savings—without high-pressure selling.

7,500,000 workers are regularly buying an individual average of $20 of Savings Bonds per month. Show your employees that you want them to have the convenience of Payroll Savings. You'll find it easy to set up the Plan in your company. All the materials and assistance you need are available from your State Director, U. S. Treasury Dept., Savings Bonds Division. (See your phone book.) Why not talk it over with him now?

The Treasury Department acknowledges with appreciation the publication of this message by

THE PAPER INDUSTRY and PAPER WORLD

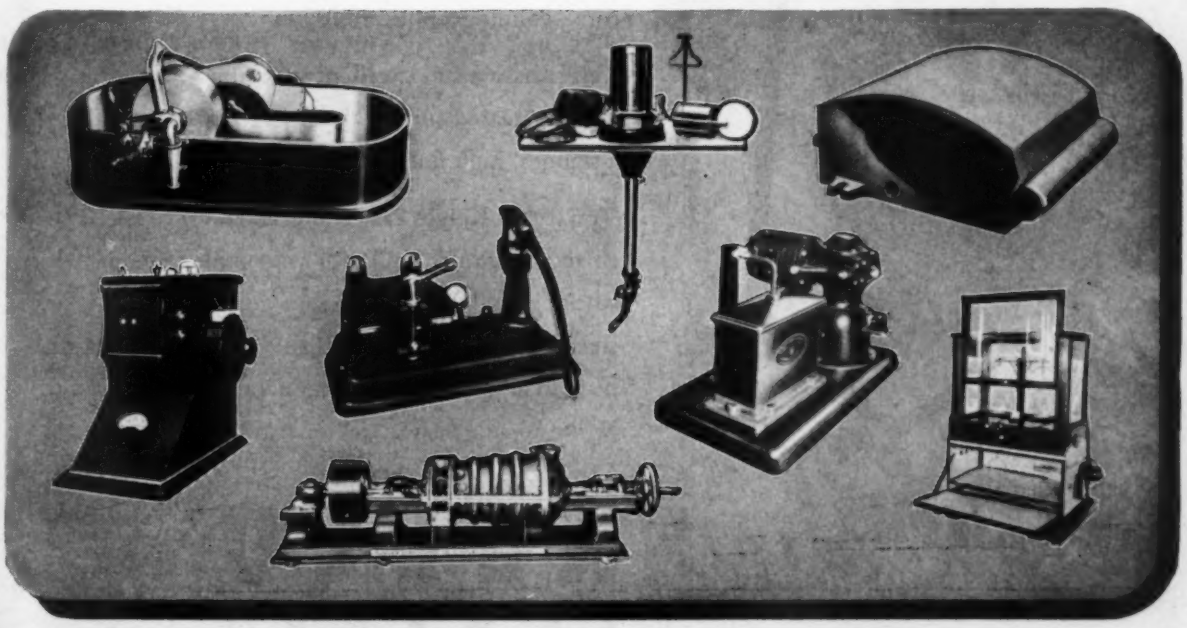
This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

My mill pays dividends, too!

"IT'S not a big mill. In fact, it's a little mill. But it pays big dividends. Since installing Valley Equipment — we can run *complete pulp tests* and save the high cost of mill experimentation. We know, at all times, the quality characteristics of our pulp — and thus maintain continuous control of paper quality. It saves a lot of money — and we're turning out better paper!"

If your mill is not equipped with a Valley Equipment Laboratory — write for our comprehensive bulletin on this important phase of mill operation.

VALLEY IRON WORKS CO.
Appleton, Wisconsin



VALLEY *Laboratory Equipment*

KELGIN

try this for size..

on wax-coated paperboard

● Try Kelgin, the modern algin surface size, and you'll agree it's the perfect surface size for wax-coated paperboard used in milk containers and corresponding applications.

Kelgin assures an excellent wax film because it gives increased surface density . . . makes possible a smooth, high finish.

You'll find Kelgin easy and economical to use. The correct Kelgin formula for your milk container stock or similar board can save you money in sizing costs. Our Technical Service Department will be glad to advise you and cooperate in every way. Write to our nearest regional office.

KELGIN ...A PRODUCT OF **KELCO COMPANY**

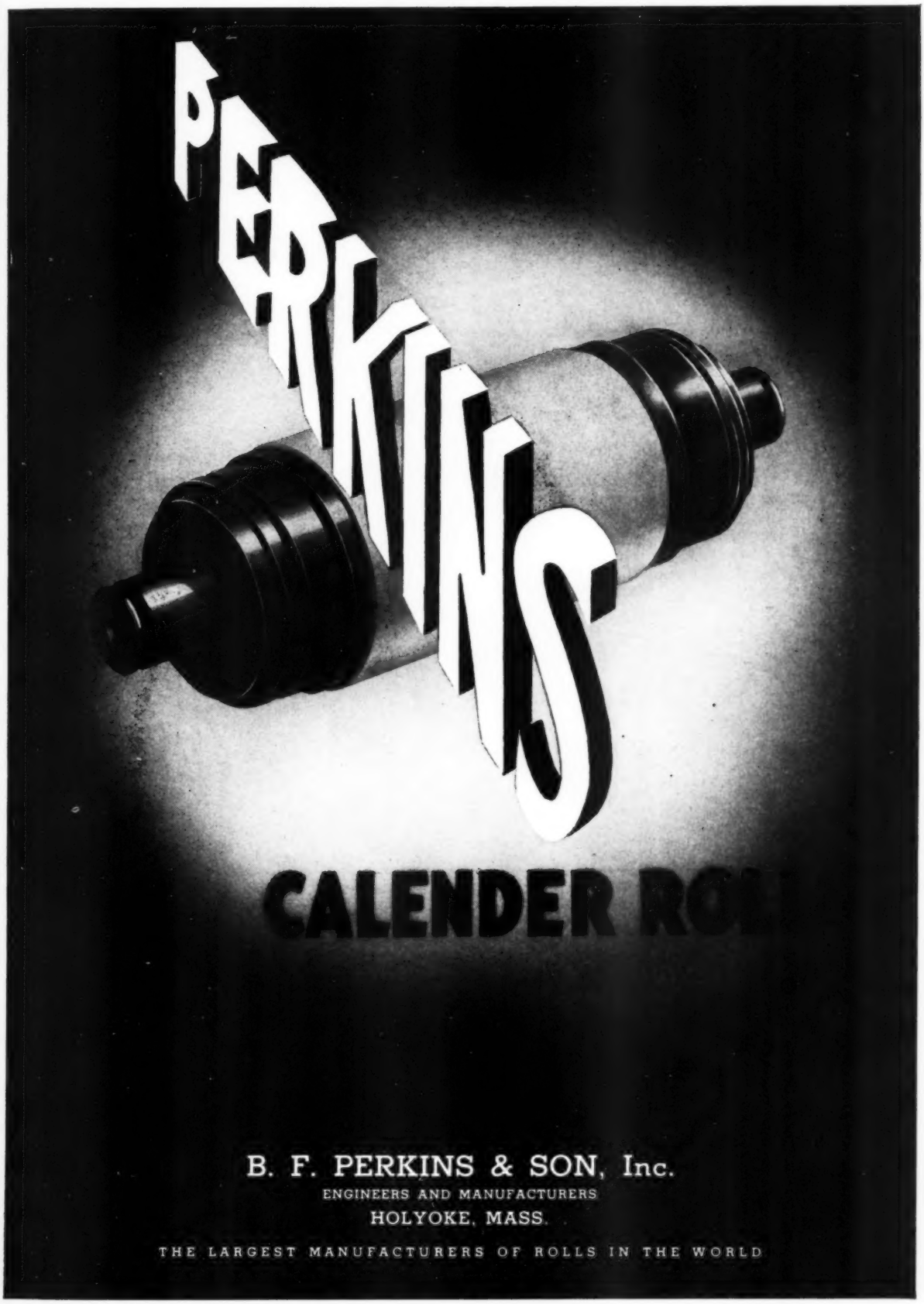
KELGIN REFINED ALGIN PRODUCT

20 N. Wacker Drive
CHICAGO 6

31 Nassau Street
NEW YORK 5

530 W. Sixth Street
LOS ANGELES 14

Cable address: KELCOALGIN — New York



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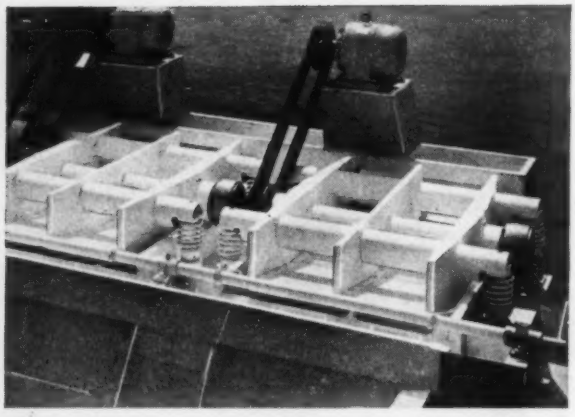
ENGINEERS AND MANUFACTURERS

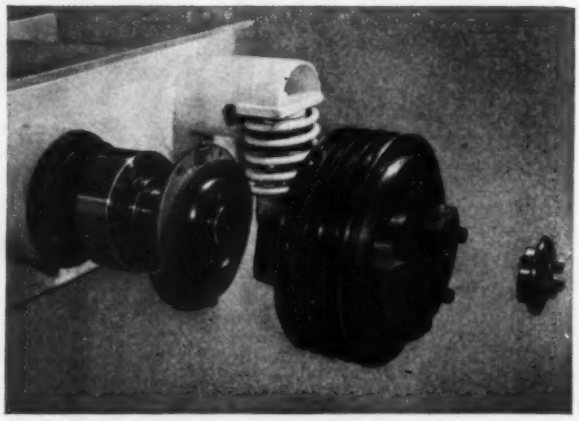
HOLYOKE, MASS.

THE LARGEST MANUFACTURERS OF ROLLS IN THE WORLD

Torrington Spherical Roller Bearings carry gyratory loads in IMPCO Vibratory Deknotters

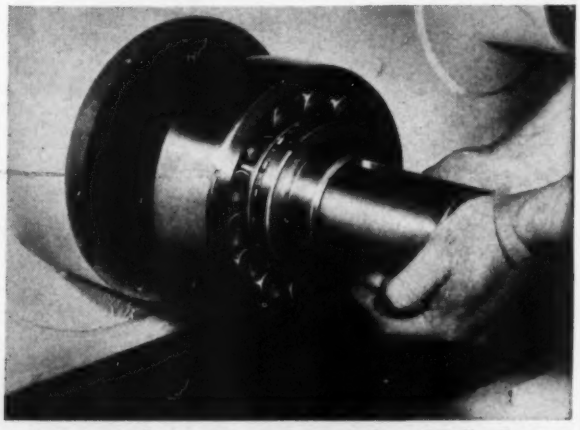


Knots and foreign matter are efficiently screened from paper pulp by the Vibratory Deknotter built by Improved Paper Machinery Corp., Nashua, N. H. The spring-mounted unit, with its perforated plates, is made to vibrate by unbalancing a shaft rotating in Torrington Spherical Roller Bearings.



An exploded view of the shaft mounting is shown above. Off-center weights at the end of the sheave set up a sharp vibration as the shaft rotates at 1650 rpm. Accepted stock passes through the screen, rejected material is discharged. Load on the two Torrington Bearings is 6000 pounds.

Installing rear bearing. Free-running alignment is maintained despite shaft deflection that might arise from the gyratory motion. The full load-bearing contact area of Spherical Roller Bearings is always uniformly available. Binding stresses cannot develop, so long service life is assured.



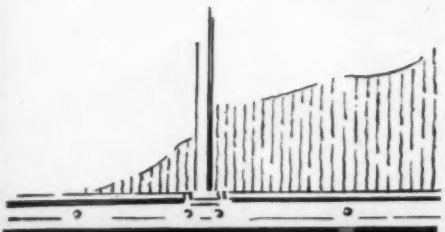
Unit design and easy access make the Spherical Roller Bearings easy to install and service. The front bearing, above, is mounted on the shaft and slipped into the housing. Self-aligning Spherical Roller Bearings "true up" automatically, giving perfect initial alignment without adjustment.

These features, plus the high capacity, smooth operation and freedom from wear of Spherical Roller Bearings, assure reliable, long-lasting performance in paper mill equipment. Let our engineers help you adapt them to your machinery. Write us today. THE TORRINGTON COMPANY, South Bend 21, Ind., or Torrington, Conn. District offices and distributors in principal cities of United States and Canada.

TORRINGTON SPHERICAL ROLLER **BEARINGS**

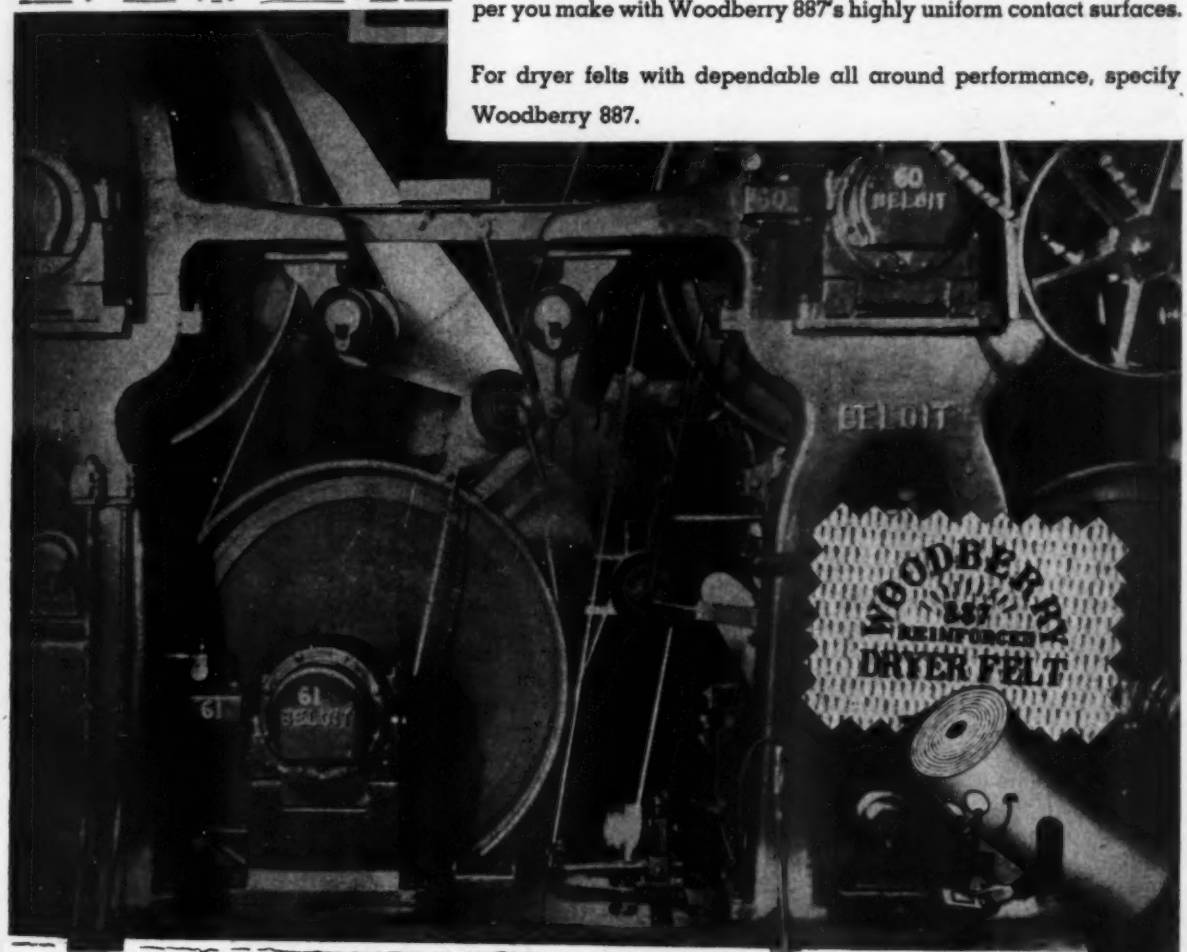
Spherical Roller • Tapered Roller • Straight Roller Needle • Ball • Needle Rollers

Paper Production Really Rolls with Woodberry 887 Dryer Felt



These patented reinforced dryer felts really keep paper production rolling. Asbestos yarns woven at scientifically determined intervals into their face insure toughness, longer service, fewer replacements, less interruptions in production. Important too are the extra savings you'll find it the lowered steam consumption that results from Woodberry 887's high degree of porosity—the finer qualities of paper you make with Woodberry 887's highly uniform contact surfaces.

For dryer felts with dependable all around performance, specify Woodberry 887.



uniformity makes the big difference

TURNER HALSEY
COMPANY
Selling Agents
40 WORTH ST. • NEW YORK

Mt. Vernon-Woodberry Mills

YES! GO WEST! 1949 Fall Meeting TAPPI Portland, Oregon

Branch Offices: CHICAGO • ATLANTA • BALTIMORE • BOSTON • LOS ANGELES • AKRON

FOCUSED on operating costs of a textile plant, a truly candid camera would record this view of valves in proper relation, cost-wise, to other equipment. By the simple photo-magic of showing *all* valves in the plant as *one* valve, the picture points up an important fact—that valves, collectively, are a major investment in *any* plant, *any* large building where operation involves fluid control.

IT PAYS MANAGEMENT to keep this fact in mind. With wages and material costs the highest ever, valve maintenance costs must be watched as carefully as operating expense of larger plant units.

EXCESSIVE MAINTENANCE of one inferior valve is insignificant, but multiplied by thousands, it is a serious drain on operating budgets.

JENKINS BROS. helps you meet this problem two ways. First, by building extra endurance into Jenkins Valves, making them the longest-lasting, lowest-upkeep valves that money can buy. Second, with advice from Jenkins Engineers on any question of proper selection, installation, or maintenance.

For all new installations, for all replacements, rely on Jenkins quality and engineering for lowest valve costs in the long run. Sold through leading Industrial Distributors.

•

Jenkins Bros., 80 White St., New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.

"PREVENT VALVE FAILURE" is a 28-page guide to valve economy, fully illustrated, with case histories of valve damage, and recommendations for its prevention by proper selection, installation, inspection, and maintenance. FREE on request. Write JENKINS BROS., 80 White St., New York 13, N. Y.

LOOK FOR THIS JENKINS DIAMOND MARK

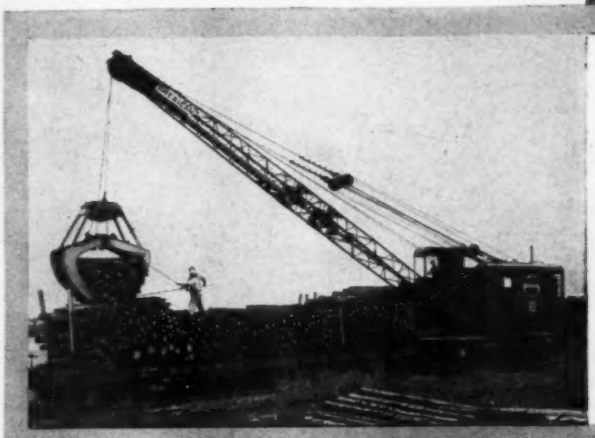
SINCE Jenkins Bros. 1864

JENKINS VALVES

Types, Sizes, Pressures, Metals for Every Need

FIVE...SIX...

pick up sticks



SEVEN...EIGHT...

lay them straight

NINE...TEN...do it again!

The American Dieselectric is both a locomotive and a crane. But when you see it handling pulpwood, you will classify it also as a first class loader and stacker. Specially designed models like this one, built for Minnesota and Ontario Paper Company, cut the cost of "picking up sticks" to rock bottom. Notice the high, off-center cab, which lets the operator see the top of high pulpwood piles. Think of *diesel* power to the deck, *electric* power to the wheels . . . the great, basic invention that made the DIESELECTRIC. With 14,000 lbs. of wearing parts eliminated; with new, speedy "live boom" action; with a wonderfully clean, efficient machinery deck, the AMERICAN DIESELECTRIC offers such savings that it actually *pays for itself in five years!* Want more facts? Mail the coupon for illustrated catalog.

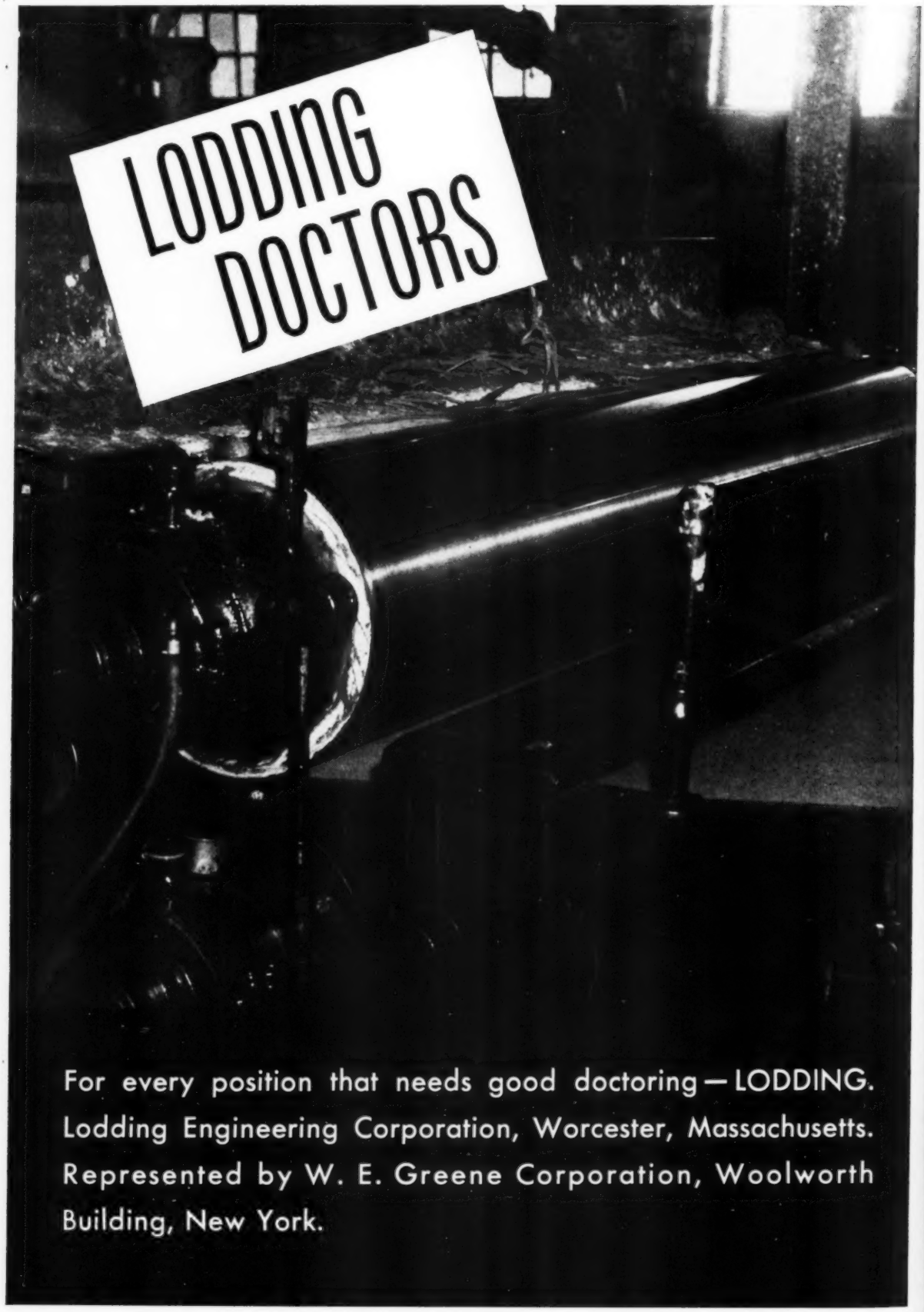
American Hoist
and DERRICK COMPANY
St. Paul 1, Minnesota
Plant No. 2: So. Kearny, N.J.
Sales Offices: NEW YORK • PITTSBURGH • CHICAGO

DIESEL-ELECTRIC LOCOMOTIVE CRANE, PATENT No. 2083460. TOUCH CONTROL, PATENT No. 2370856.

9612

AMERICAN HOIST & DERRICK CO., St. Paul 1, Minnesota
Please send me Catalog 600-L-4, on the American Dieselectric Locomotive Crane

Name_____
Company_____
Address_____
City_____ State_____
42


LODDING
DOCTORS
For every position that needs good doctoring — LODDING.
Lodding Engineering Corporation, Worcester, Massachusetts.
Represented by W. E. Greene Corporation, Woolworth
Building, New York.

"WE'RE PLAYING THE *Blue Chips!*"

"Keep your eyes on that felt book, Boss. You'll see how production goes *up* and costs go *down* when Hamilton Felts go *on*.

"We are hanging up new records with Machine Number Four since we equipped the presses with Hamilton Felts. They sure do squeeze out the water. The drier rolls are spinning at top speed—not hot enough to make the sheets brittle. Just tough and with a swell finish.

"Yes sir, from the thinnest tissue to the heaviest board there is a Hamilton Felt that makes every press do its work better, faster and at lower cost."

SHULER & BENNINGHOFEN, HAMILTON, OHIO

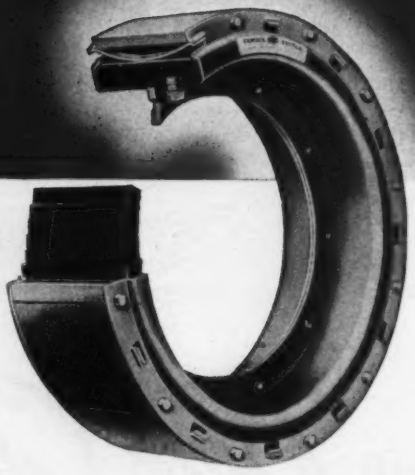
Miami Woolen Mills

Hamilton Felts

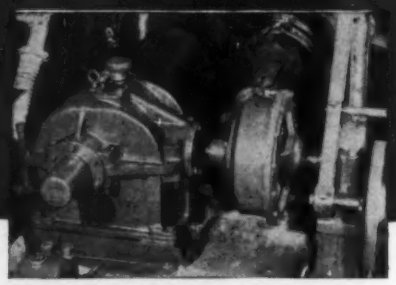
Established 1858

FAWICK-EQUIPPED MACHINES

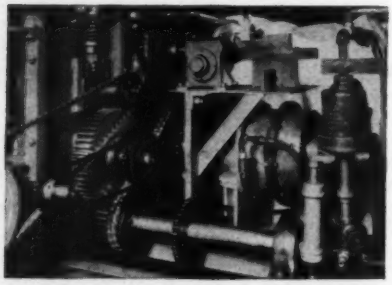
do More Work at Less Cost



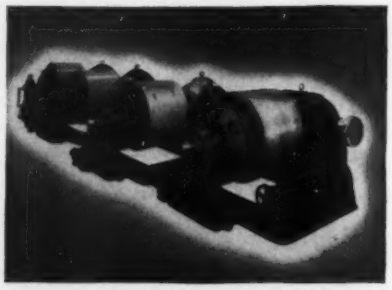
Fawick Air-Ring Clutch or Brake Type E



Fawick Airflex element used as Couch Drive Clutch at Crane & Co., Dalton, Mass.



2 Fawick Airflex elements used as clutch and brake on "One-Revolution Knife" by Roofing Machinery Manufacturing Co., Chicago, Ill.



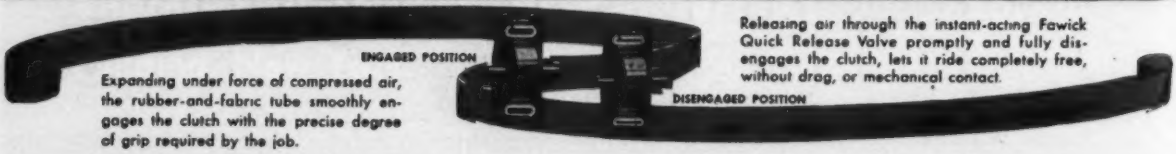
Fawick Airflex Clutches supplied on Black Clawson dryer section drives.

Time-wasting clutch adjustment down time is practically eliminated on Fawick-equipped machines. The moving parts of this Fawick Clutch—the rubber-and-fabric pneumatic tube and the friction shoe assemblies—adjust automatically and compensate for wear.

The smooth engagement action of this Fawick Clutch eliminates sudden shock loads which damage machinery. Controlled torque starting can be obtained with a simple modulating air valve. This type Fawick Clutch is ideally suited to continuous slip applications.

For specific recommendations for your machines, write to our Engineering Department today. Address Dept. PI.

FAWICK Airflex CO., INC.



Expanding under force of compressed air, the rubber-and-fabric tube smoothly engages the clutch with the precise degree of grip required by the job.

Releasing air through the instant-acting Fawick Quick Release Valve promptly and fully disengages the clutch, lets it ride completely free, without drag, or mechanical contact.

THE PAPER INDUSTRY
and PAPER WORLD
AUGUST 1949

Editorial

Where Are We Going?

▶▶▶ IF ANYBODY HAD COME up with the prediction last October, that in the following eight months, the business of this country would shrink 26 points, or 13.3 per cent in volume, he would have been hailed as an idiot. And yet, that is just what has happened, and there are no candidates for the idiotic crown.

Says the latest report from the Federal Reserve Bank: "The wheels of industry during June were turning at their slowest rate in *over three years.* The Reserve Board's calculation of industrial output on a seasonally adjusted basis placed last month's production by mines and factories at 169 per cent of the 1935-39 average. In the preceding month, it was 174 per cent and in October, 1948, it was 195 per cent. Thus, the eighth-month output has successively declined; it has now dipped 13.3 per cent below the postwar peak of October, 1948."

You may search the economic records; ask every economic authority you ever heard of and you will get not one lucid, logical explanation for this prize economic phenomenon.

The Federal Reserve Board offers no explanation.

We have witnessed the complete turn-about, flop, upside down findings of the President's Committee of Economic Advisors in their report of July 15, as contrasted with the advice they gave him for his January 3 report to the Congress. It all adds up to confusion and none of it makes sense. And yet, the downward trend in industry and commerce continues, despite the predictions in high places that we were to have no economic deflation.

Is there no answer to this seemingly baffling problem?

Of course, there is!

The Federal Reserve Board and the U. S. Commerce Department furnish us monthly records of the facts of business life. Business operations are geared basically to those facts.

It is an axiom among intelligent business management that "give us the basic facts underlying business and we'll tell you how it will operate."

What then are the underlying basic facts of business today?

Lack of confidence in our Government.

The loss of confidence began on November 3, 1948.

It was manifested immediately following the election. October, 1948, was the peak postwar month. The Federal Reserve Bank Index figure was 195; November, it was 194; December, it was 192. It sank 3 points—all just the reverse of the previous year, when in October, 1947, it was 190; November, 192, and December, 192—it gained 2 points that year and closed on its high point.

Then, on January 3, 1949, the ax fell which cut off the head of the goose which laid the golden eggs—the demand from the Executive for higher taxes and more taxes, and more and more reckless governmental spending—the all too clearly designed plan to pay off the extravagant campaign promises of a desperate political party.

Everything which has happened since that memorable day in January has only served to confirm the conviction of industry and business that the economy of the country was menaced as never before with an ultimate, which spelled bankruptcy if the administration was unchecked.

Hence, as confidence declined, business activity began the slide. Look at it!

*January	—191
February	—189
March	—184
April	—179
May	—174
June	—169

(*President's Message to Congress.)

A twenty-two point slide in six months is the yard stick measuring the cumulative loss of confidence of the people of this country in this administration. At an activity of 169 per cent, we are back as of July 1, 1949, to the March, 1946, volume of business.

Loss of confidence in the integrity of government is a very definite, concrete factor in our business economy, especially since the administration continues to inject its dominance and expand its controls into every segment of our free enterprise system.

That dominance and control, the people inherently resist. They don't like it. They won't support it. Their resistance to it is found registered in the continued decline of business activity from the peak of October to the depth of June.

Will a further slide of 5 points appear in the July record? We would not be surprised if it slid that or more.

So, *quo vadis*—where are we going?

We are still at war, four years after final hostilities have ceased. A perfectly indefensible situation maintained simply to keep regimenting controls in the hands of the Executive.

We still have war taxes.

We are moving up into increased spending for war in peace times. There is no hint of economy in the cost of government expense. On the contrary, every evidence of the plan to boost it.

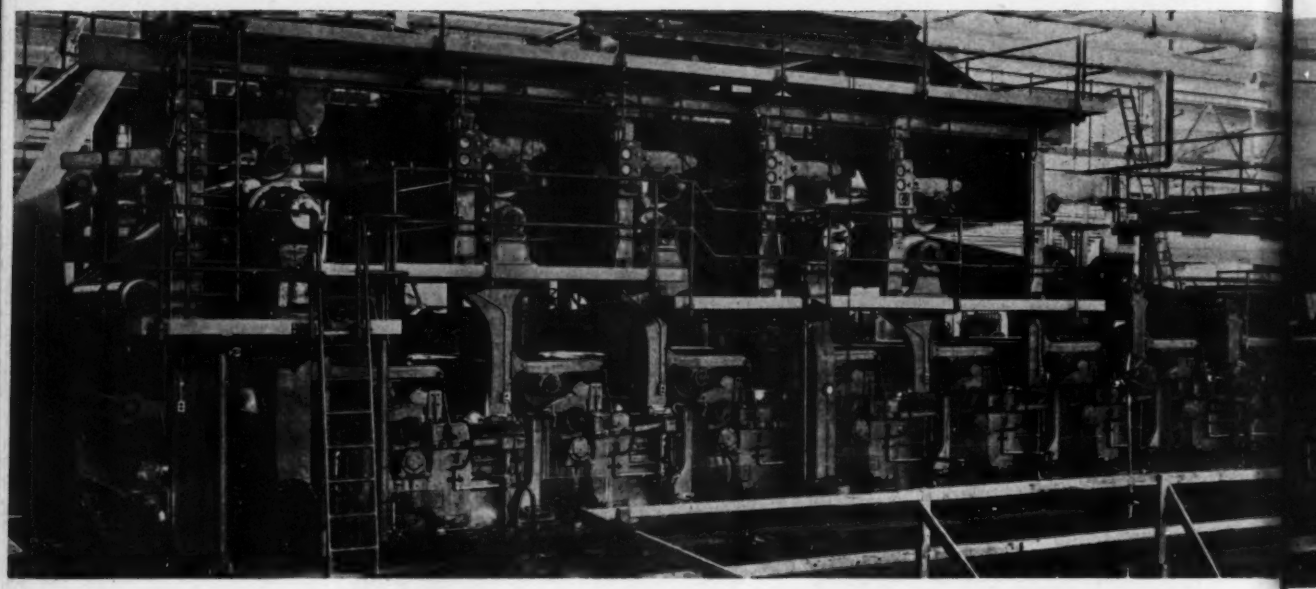
These are the things the people don't like. They know the import of them. They will rather liquidate than speculate.

They will not risk investment which may be nationalized.

These are the cogent reasons why our national income stopped at 225 billion dollars in 1948 instead of going on to a total of 300 billion dollars in 1949 and 1950.

The lack of confidence in our present governmental administration is the outstanding cause for the recession we are witnessing.

Confidence is defined as the reaction of human beings to their environment. It is only in an environment of national confidence that the business economy of this country will expand.



THE WET END . . . 8-cylinder molds and 5 primary presses

Sutherland Now Operating

▸▸▸ A NEW EIGHT-CYLINDER paperboard machine, probably the largest unit of its type in the Middle West, went into production on July 20 in the new board mill of the Sutherland Paper Company, Kalamazoo, Michigan.

The machine engineering, layout, and installation was handled jointly by A. L. Sherwood, vice president in charge of engineering, and Glen Sutton, board mill superintendent. Mr. Sutton, who will be in charge of the new mill, also is superintendent of three of the company's four other board mills.

Built by The Black-Clawson Company (Hamilton, Ohio), the machine stretches approximately 900 feet from beater room to cutters. According to Sutherland officials, soon it will be turning out 200 tons of paperboard a day — approximately 60,000 tons a year.

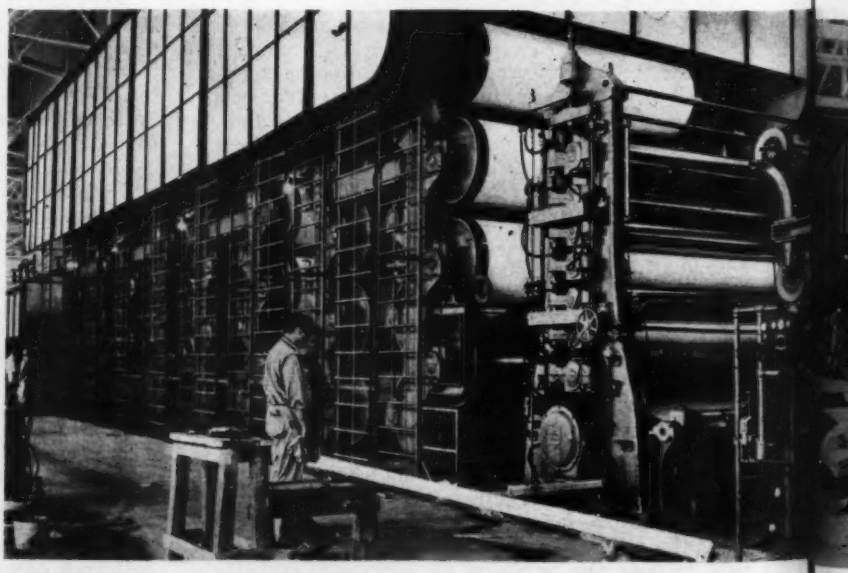
Stock Preparation

The stock preparation system is designed to handle four types of stock: top liner, underliner, filler, and bottom liner. A complete Black-Clawson-Shartle-Dilts stock preparation system was installed for this purpose. The system consists basically of four Hydrapulpers, two Hydrafiners, and five jordans, together with the necessary control equipment, cleaning equipment, thickeners, agitators, pumps, etc.

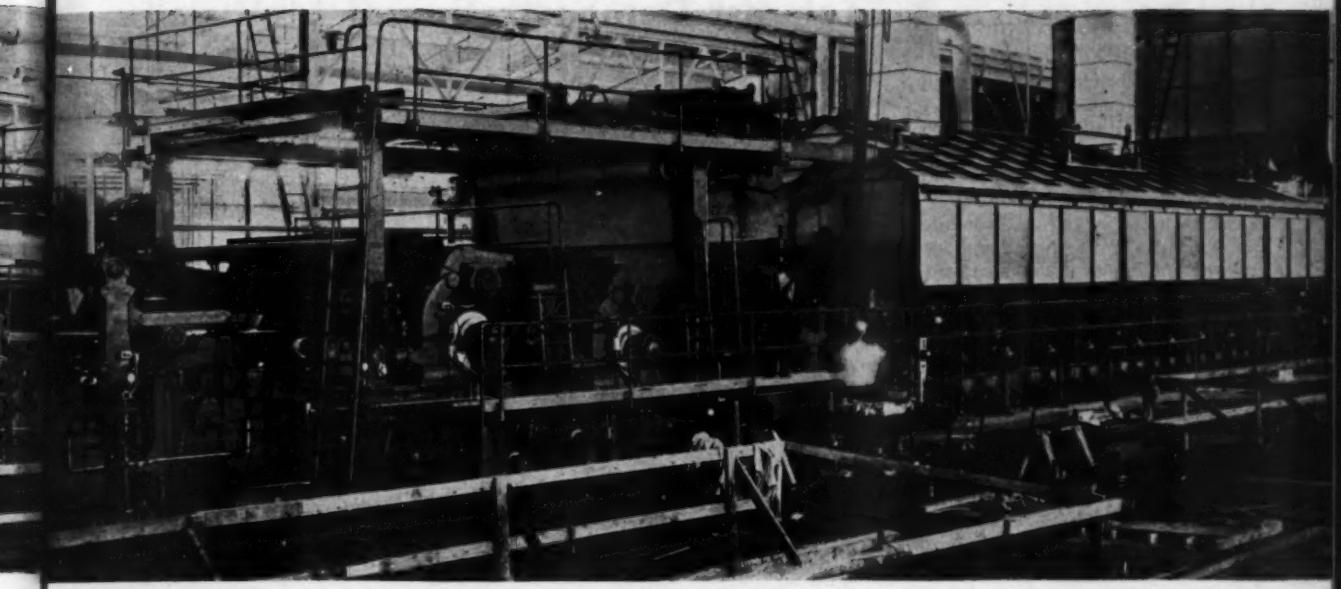
In the basement, bales of raw filler stock are placed on an elevator that charges the 20-ft Hydrapulper. This unit operates continuously and is equipped with an automatic Ragger and junk remover. Defibered stock passes through the perforated extraction plates, through the regulating box and is pumped to the grit remover. Floating rejects are then separated from the fiber in three Classifiners, are run through a disintegrator pump, and then to the Selectrap from which all usable fiber is removed.

Cleaned stock is then dewatered in three couch-type thickeners and drops to the filler dump chest. From there it is pumped to the jordan headbox, is jordanned and falls to the filler machine chest.

Liner stock is defibered in three 14-ft batch operated Hydrapulpers, each of them automatically loaded by indi-



STACK DRYERS . . . Vertical tiers contain 92 dryers



PRESS SECTION . . . 3 main presses and first dryer section

Giant New Board Machine

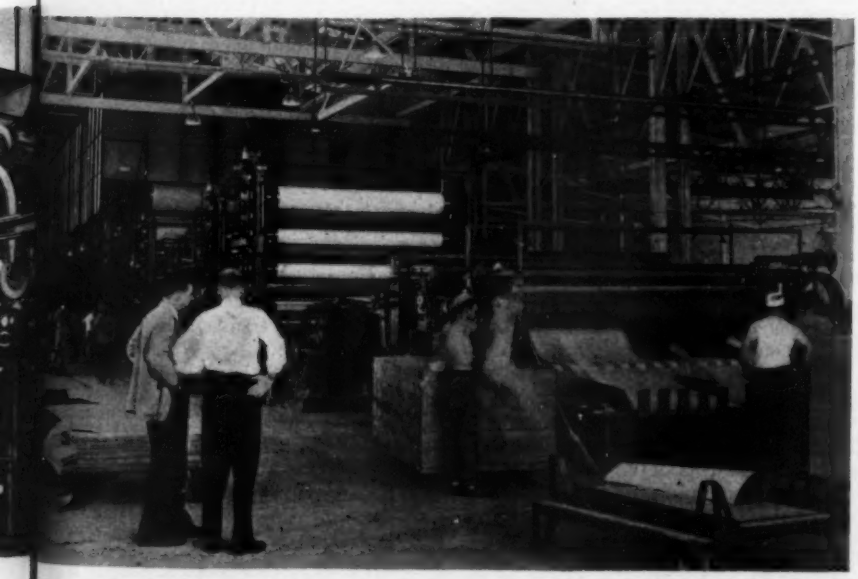
vidual inclined conveyors. After it is defibered, the stock is pumped to one of the two vertical Hydracycle chests where it is recycled through a Hydrafiner. Two Hydracycle chests and Hydrafiners are employed for the different liners. After Hydrafining, the stock is dumped to liner chests before going to the jordan headbox. It is then jordanned and flows to the liner machine chests.

One of the important characteristics of the stock preparation system is that it is designed to eliminate back-breaking labor and unnecessary manual operations. Each of the liner Hydrapulpers and the two Hydrafiner systems are equipped with individual control panels. Motorized valves and centralized pushbutton control bring operations to a high state of efficiency.

All stock chests are equipped with Agiflow circulation and pumping systems while the Hydracycle chests are equipped with propeller agitators. All chests are built of tile by the Kalamazoo Tank and Silo Company.

From the machine chests, stock is pumped to the fourstock headbox that regulates the volume of stock to each of the eight vats of the cylinder machine. Stock flows by gravity to each of the eight Packer flat screens (Sandy Hill Iron and Brass Company), which discharge accepted stock to stainless steel mix boxes which in turn supply stock to the cylinder machine vats.

Size is prepared in the Hercules automatic rosin size emulsification system.



THE DRY END . . . Finished board (200 tons per day) is sheeted on duplex cutter

Board Machine

Sutherland's newest board machine (designed and built by The Black-Clawson Company) is one of the industry's largest and most modern. Made up of 8-cylinder molds—each 154 inches wide by 42 inches diameter, it trims 136 inches at the dry end. The machine employs a suction drum, suction primary and three plain primary presses, as well as three main presses. The main presses are all made up of Stonite top rolls and brass bottom rolls. Each pair of press rolls is air-loaded and is controlled by Foxboro pressure regulators. Press felts are equipped with Vickery felt conditioners.

Two chests receive and keep sepa-

rate the white water from the filler and liner cylinders. Fiber is recovered in two Sveen-Peterson save-alls.

The dryer section of the machine consists of 118 cylindrical dryers of 42-inch diameter. It is divided into three parts. The first consists of 21 dryers in the conventional horizontal two-deck arrangement. This is followed by 92 dryers arranged in vertical tiers. From the vertical dryers, the sheet passes through a calender stack, then to the Waldron Microjet coater (when used), then over five coating dryers. Coating dryers are followed by two more calender stacks and a Pope type reel. When this is used, the full reels are lifted from the reel arms and transferred laterally to a Moore & White rewinder. When desired, the sheet bypasses the reel and goes direct to the Black-Clawson duplex cutter where it is slit and cut into sheets.

Steam to the dryers is controlled by Fisher Governor Company pressure regulators and the machine is equipped with a Midwest-Fulton drainage system and a Bowser lubrication system. Both the horizontal and vertical sections of dryers are equipped with J. O. Ross Engineering Company hoods and vapor absorption system.

The machine is driven by a standard Black-Clawson lineshaft drive powered by a 650-hp Westinghouse steam turbine. Cone pulleys and leather belts transmit motion to spiral bevel gear reduction units that drive the different sections of the machine. Individual section units are controlled by use of Airflex clutches.

Machine Room . . . Crew Expansion Completed

The new building housing the machine is the equivalent of a two-story structure and covers 190,000 sq. ft. It has been built to house a duplicate of the machine just put into operation. However, completion of the work and the beginning of operations in this mill mark the end of the general program of expansion instituted by Sutherland at the beginning of 1946. Construction on the work just completed was begun in July of 1947.

An actual crew of 20 men will work the big unit and handle the beater room. It is expected, however, that additional electricians and auxiliary help will bring the crew to 30, or 90, workers in a 24-hour span of three shifts.

The productive value of the huge machine is revealed in the fact that its 200 tons a day is more than half the total output of the company's other four board mills, now rated at 385 tons daily.

Telecast Demonstration of Multiwall Bags Gives Announcer Tough Time

Announcer Radcliffe Hall (center) tries to "go through" one of the Union Bag Corporation's multiwall bags during telecast demonstration. H. Stuart Daniels, executive vice president of Union Bag (right) appeared on the program. Also shown is Ivan Sanderson, producer of the show

▶▶▶ ON A RECENT TELECAST of "National Treasures," a show devoted to science and industry, H. Stuart Daniels, executive vice president of Union Bag & Paper Corporation, New York City, appeared as a guest star.

This feature was programmed over WNBT in New York, key station of the NBC television network. Mr. Daniels discussed paper and paper bags. To illustrate the conversion of chips to paper, sections of Union Bag's moving picture film were used, and company bag samples were shown by Mr. Daniels to illustrate the variety of consumer items produced by that organization.

The high point of the program came when—for the first time on television—Radcliffe Hall, a six-foot announcer, tried to punch his way out of one of the company's multiwall bags. Mr. Daniels held the bag upright while the announcer started swinging. The bag itself suffered no damage, but Mr. Daniels found himself on the receiving end of Hall's punches, and almost "took the count."

Time Has Discontinued Operation of Its Coating Mill in Kalamazoo

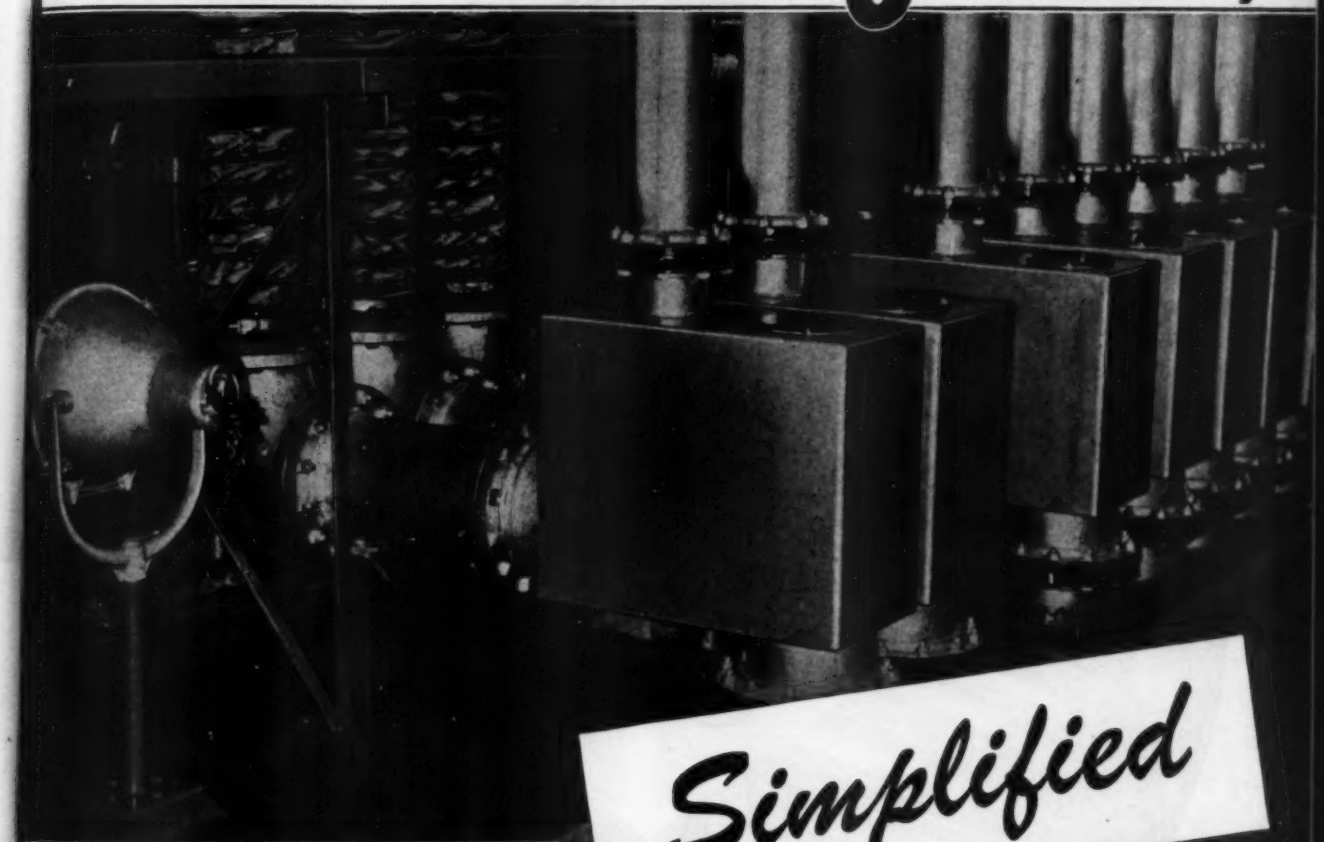
▶▶▶ FINIS WAS WRITTEN to the history of Time Inc., as an operating company in the Kalamazoo River Valley paper field when on July 14 it ran the last of its paper through the coating mill here and then ceased operations.

Its Graphic Arts Laboratory in Kalamazoo, which became famous throughout the country for its exceptionally fine equipment and its daring approach to age-old paper problems, was abandoned the first of the year and its work concentrated in Time Inc., research laboratory at Springdale, Connecticut. The building has been sold to the Orthopedic Frame Company, manufacturers of a special line of surgical and hospital equipment.

Reviewing the transactions which have gone before:

This month the St. Regis Paper Company assumes occupancy of the coating mill, built for Time during the war and which has been operated by St. Regis under a lease agreement. Very soon, according to an announcement made last March by Roy K. Ferguson, St. Regis president, his company will prepare to install its Panelyte Division in the former coating mill, for manufac-

PAPER · · · America's 6th Industry

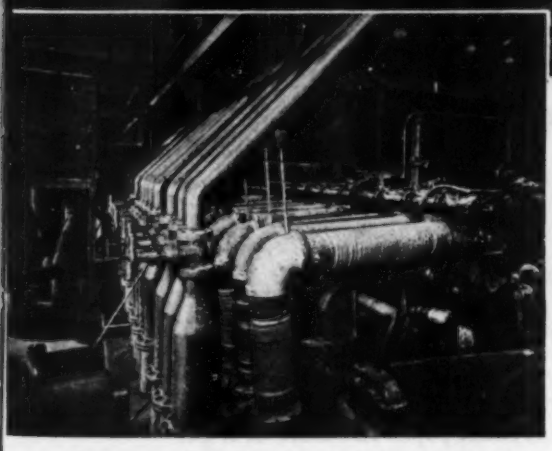


Simplified

Suction Box Connections

In the new Puseyjones Machines, each fourdrinier suction box is connected to the air and water header by a simple, single flexible connection. Gone is the cumbersome double hose connection that has always been a source of trouble and an eyesore to the machine operators.

This simplified suction box connection is just one of the many design improvements in the new Puseyjones Machines, improvements that mean higher speeds, lower production costs and improved competitive position. Let us give you the facts.



Above: new fourdrinier suction box connections on the latest Puseyjones Machines are simple, flexible.

Below: conventional cumbersome suction box connections were often a source of trouble.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

YES
GO
WEST
1949 Fall Meeting
TAPPI, Portland, Ore.

VICKERY DOCTORS are the tried and true way to get your papermaking rolls shined up and keep 'em that way — and that means better paper and more of it per day at lower cost per ton.

Next time you walk past the machine cast an eye on the rolls. If any of them are dull, dirty, streaky or fuzz-covered ask us to give you a layout and estimate on Vickery Doctors carefully engineered to each individual roll.

BIRD MACHINE COMPANY, South Walpole, Massachusetts

VICKERY DOCTORS

ture of a laminated plastic, in Kalamazoo. (cf. P.I. and P.W., March, 1949, p. 1723)

Time became established in Kalamazoo in 1945 with the purchase of the Bryant Paper Company. Allan B. Milham, Bryant president, remained as resident manager of the plant, which was designated Bryant Division, St. Regis Paper Company. Immediately Time instituted an extensive program of expansion and modernization.

At the same time, Time added the Maine Seaboard Paper Company, Bucksport, Maine, and later the Hennepin Paper Company (Little Falls, Minnesota) to its holdings.

In December of 1946, sale of the two mills just mentioned and the Bryant Paper Company to St. Regis Paper Company was announced. However, it was agreed that the coating mill, then in process of construction, should be retained by Time to coat stock shipped here from other mills for three years, when it would become the property of St. Regis. The transfer was completed in a slightly shorter period.

With St. Regis' assumption of ownership, Peter J. Massey, now chairman of the production development committee of St. Regis with offices in New York City, replaced Mr. Milham in Kalamazoo as general manager.

Meanwhile, the Graphic Arts Laboratory continued its work for a time, and then its operations were, for efficiency reasons, shifted to the Springdale laboratory. Nicholas L. Wallace, assistant to the vice president of Time Inc., remained in Kalamazoo after the sale of the Bryant mill to St. Regis as Time's resident representative.

A short time ago Mr. Massey was transferred to the New York office of St. Regis and Fred C. Goodwill became St. Regis manager in Kalamazoo. As yet there has been no definite announcement of the plans of St. Regis for the former coating mill other than President Ferguson's announcement of the shift of the Panelyte Division here.

▼

ALAN HELFFRICH TO HEAD OWN PAPER SALES OFFICE

Alan B. Helffrich, until recently general sales manager of St. Regis Paper Company, has announced the formation of his own paper sales organization to be known as Alan B. Helffrich Company, 369 Lexington Avenue, New York 17. Telephone: Murray Hill 6-9077.

Alan Helffrich will be remembered by many as the famous Penn State and N.Y.A.C. Olympic middle distance track champion and as the only American ever to beat Paavo Nurmi.

After graduating from college his first position was as salesman for the Orono Pulp & Paper Company. Since then he has held increasingly important sales posts with Price Brothers, Eastern Corporation, Fraser Industries, and finally St. Regis Paper Company from which he recently resigned. All those in the paper and allied fields also know Alan as a charter member of the Salesmen's Association of the Paper Industry and its present competent and popular president.

When interviewed, Mr. Helffrich said, "For several years it has been my uppermost desire to strike out on my own and put my broad paper sales experience to work for the benefit of my paper suppliers and customers. I call myself a paper specialist and my job is two-fold: offering my customers scientific, unbiased paper selection, and giving my paper suppliers efficient, trouble-free distribution of their many brands."

Alan B. Helffrich

James M. Owens

DEVELOPMENT OF FORESTRY COLLEGE ADDS NEW BLDG. AND ANOTHER STAFF MEMBER

The growth of the New York State College of Forestry (Syracuse, New York) and expansion of the broad service it gives both to the wood-using industries and to New York State have reached another milestone.

The college is soon to have a new building devoted to forest products and wood utilization generally. Research now under way at an over-all cost of $225,000 for this year, includes studies of decay of wood in service, natural-fiber plastics, curing of glue-lines by high frequency heating, utilization of farm woodlots and their future productivity, pulping of hardwoods, and improved methods of kiln-drying lumber.

As an additional service to New York state, the College has expanded its Department of Forest Extension through the creation of a new post. The appointee, James M. Owens, took over his new duties on June 15. He will be extension specialist in wood utilization, traveling the state as liaison between the College and industry.

Mr. Owens graduated from the New York State College of Forestry in 1938, having majored in wood utilization. Before the war, during which he served with the AAF, 3rd Bomber Command as captain, Mr. Owens was superintendent of the U.S. Gypsum Company fabricating plant at Lisbon Falls, Maine, a position that included the supervision of wood-working equipment operations in the manufacture of wood-base wallboard and tile. He also helped develop the company's program of wood waste utilization. Later, he was technical representative on adhesives and plastics in the north Atlantic states for American Cyanamid Company; his most recent position before taking on his new work at the College was plywood plant supervisor and assistant sales manager for Fancher Furniture Company, Salamanca, New York.

▼

GRAND RAPIDS TANGLEFOOT PLANT HAS A NEW OWNER

The plant of the Grand River Paper Corporation, Grand Rapids, Michigan, has been purchased by McLaurin-Jones Company, of Brookfield, Massachusetts. The Grand River company is better known in the trade as manufacturer of the famous Tanglefoot Gummed Products, and this trade name passes to the new owners. McLaurin-Jones Company long has been known as manufacturer of gummed, coated and specialty papers.

The Grand River plant will be operated as the Grand Rapids Division of McLaurin-Jones. Headquarters of the newly-combined operation will be in Brookfield, but it is planned to continue the same personnel in Grand Rapids. The new owners will explore the possibility of additional lines for the Grand Rapids plant. The new management will be represented in Grand Rapids by William C. McLaurin.

▼

WEST VA. P&P MILL AT MECHANICVILLE DOWN FOR EQUIPMENT INSTALLATION

Operations at the Mechanicville, New York, plant of the West Virginia Pulp and Paper Company will be interrupted this month while new equipment is being installed, officials announced recently. The entire mill closed down August 14 and 15, and two paper machines will be down for about two weeks.

This shutdown will enable the Thompson Construction Company to make new condenser water connections for the turbines including the new 7,500-kilowatt turbine generator, which will be placed in operation later in the year.

The plant will be without steam electric power while workmen make these connections.

The new turbine is expected to ease

the present strain on power facilities at Mechanicville. In addition to giving the plant an adequate margin of safety in the event of breakdowns, the turbine will provide enough reserve capacity for possible expansion in the future.

The plant now operates three steam turbine generators and twelve water wheel generators. The present electrical load of more than 11,000 kilowatts normally is divided equally between these two power sources.

The new turbine is a large unit, capable of producing enough electrical power for a town of about 18,000 people. It was necessary to build an extension to the present powerhouse in order to house the equipment. The actual job of installing the turbine will begin as soon as the water connections are completed. Plant officials expect to have the turbine in operation by the end of the year.

Two paper machines will lose running time for the installation of new size presses, designed to improve the quality of the paper made on these two units. Machine 4 is scheduled to go down on August 1, and Machine 3 will be down beginning August 22.

The addition of the new size presses on the two machines will give Mechanicville a complete line of machines equipped with these units.

▼

GAIR CO. MANUFACTURING NEW EXPENDABLE PALLETS

Manufacture under license of the Addison-Semmes new lightweight expendable pallet made from corrugated materials has been commenced by Robert Gair Company, Inc., New York City. These pallets are being made at the more than twenty Gair plants in the eastern territory.

Expendable pallets have become increasingly popular the past five years due to the ease in handling and stacking goods in shipping and warehousing that results from their use. A fork truck can stack palletized goods neatly and evenly in a warehouse to ceiling height, with less time and effort. The pallet is designed for one use only and is cheap enough to be discarded after a single trip.

The pallet is made from "logs" of various diameters rolled from single-faced corrugated board on special Addison-Semmes machinery, with corrugated sheets glued to top and bottom of rows of logs, thus making a strong skid.

Not only does this pallet permit stacking of multiple package loads, but it also permits designing of a large "Power Pack," which is a single corrugated container of approximately 64 cubic feet, to carry safely loads of up to 4,000 pounds in one unit.

▼

NEW PLANT UNDER WAY IN LOS ANGELES FOR WEST. WAXED PAPER CO.

A nine-acre plot at Sheila Street and Leo Avenue, Los Angeles, California, has been sold by the Western Waxed Paper Company, a division of Crown Zellerbach Corporation, to The Mutual Life Insurance Company of New York. However, the paper company has leased back the property for a long term under provisions which call for the construction of a 200,000 sq. ft., one-story manufacturing plant and office building.

Work on the new plant is already under way and construction is expected to be completed in about a year, when Western Waxed will move its Los Angeles operations from its present location at 910 East 61st Street, where some 270 people are employed.

Announcement of the transaction was made by George C. Wieman, Los Angeles manager of the paper firm, and Henry Verdelin, vice president and manager of real estate for The Mutual Life.

▼

WATSON ISLAND PLANT OF COLUMBIA CELLULOSE CO. PROGRESSING ON SCHEDULE

Approximately 600 workers are currently engaged in the construction of the Columbia Cellulose Company, Ltd., dissolving pulp plant on Watson Island, British Columbia, and all activities are proceeding satisfactorily, according to Harold Blancke, president. Footings and foundation walls have been poured for the office, pulp storage, machine shop, and pulp finishing buildings, and the steel for the pulp storage building is being erected. During construction the latter building will be used to fabricate the pre-cast concrete roof and siding panels for the main mill buildings.

The company has leased a limerock quarry on nearby Smith Island to provide limerock for the operation of the mill. Besides this, several booming ground leases have been issued, and remaining ones will be concluded shortly.

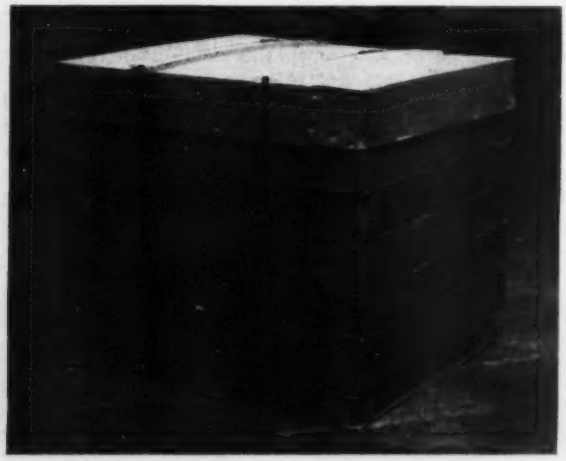
Construction of the first logging camp is well advanced and will be ready for operation next year. Arrangements for logging are well advanced, but only a small quantity will be cut this year. A heavier cut is planned for 1950 to provide an inventory for the start of mill operations, and full log production is scheduled for 1951.

▼

GOULD PAPER CO. PLANT AT McKEEVER (N.Y.) SOLD TO RICE VENEER CO., INC.

Purchase of the Gould Paper Company properties (division of Continental Can Company) at McKeever, New York, by Rice Veneer Company, Inc., successor to Rice & Salls, Inc., Fair Haven, Vermont, has been announced by Donald R. Rice, president of the newly organized firm, and R. W. Saver, vice president and general manager of Gould. The Fair Haven plant was destroyed by fire last February. The purchase price was not disclosed.

The property involved in the sale of this former groundwood pulp mill includes 70 acres of land, wood pulp mill facilities, six residences, four resort-type camps, a large store and warehouse, building repair and storage garages and stables. The new company will manufacture veneer for plywood. Mr. Rice estimated the firm will employ about 50 men, and said a subsidiary firm, Logs, Inc., will employ an additional 50 men in gathering



Tray pack program (expendable pallet) . . . One tray sits inside of another to depth of about 1 inch—top tray being 1 inch more shallow than other trays with cover made of one of the standard depth trays in inverted position. This unit load secured with two metal bands ¾ inch x .020 incorporating use of four pieces of standard 1 inch x 4 inch box lumber

timber from the Rice holdings and property.

This sale of the McKeever property to Rice is in accordance with Gould's serious effort to encourage sound and suitable industries to take over industrial facilities that are no longer necessary to the Gould operation. This is the second sale of facilities under this program, the first being the sale of the Port Leyden plant to Kelly-Forsythe Corporation, which is now using it for the manufacture of paper twisting stock.

▼

▶▶▶ THE NEW YORK offices of Thomas Galante & Sons, Inc., paper manufacturers' supplies, have been moved to the plant it has renovated in the old power house buildings of the Hudson Valley Railway in Mechanicville, New York. The company plans to install a paper machine in the larger of the two buildings, and use the smaller one as a converting and distributing plant for the products of Walloomsac Paper Mills, Inc., an affiliated company. (See P.I. and P.W., June, 1949, p. 324)

▼

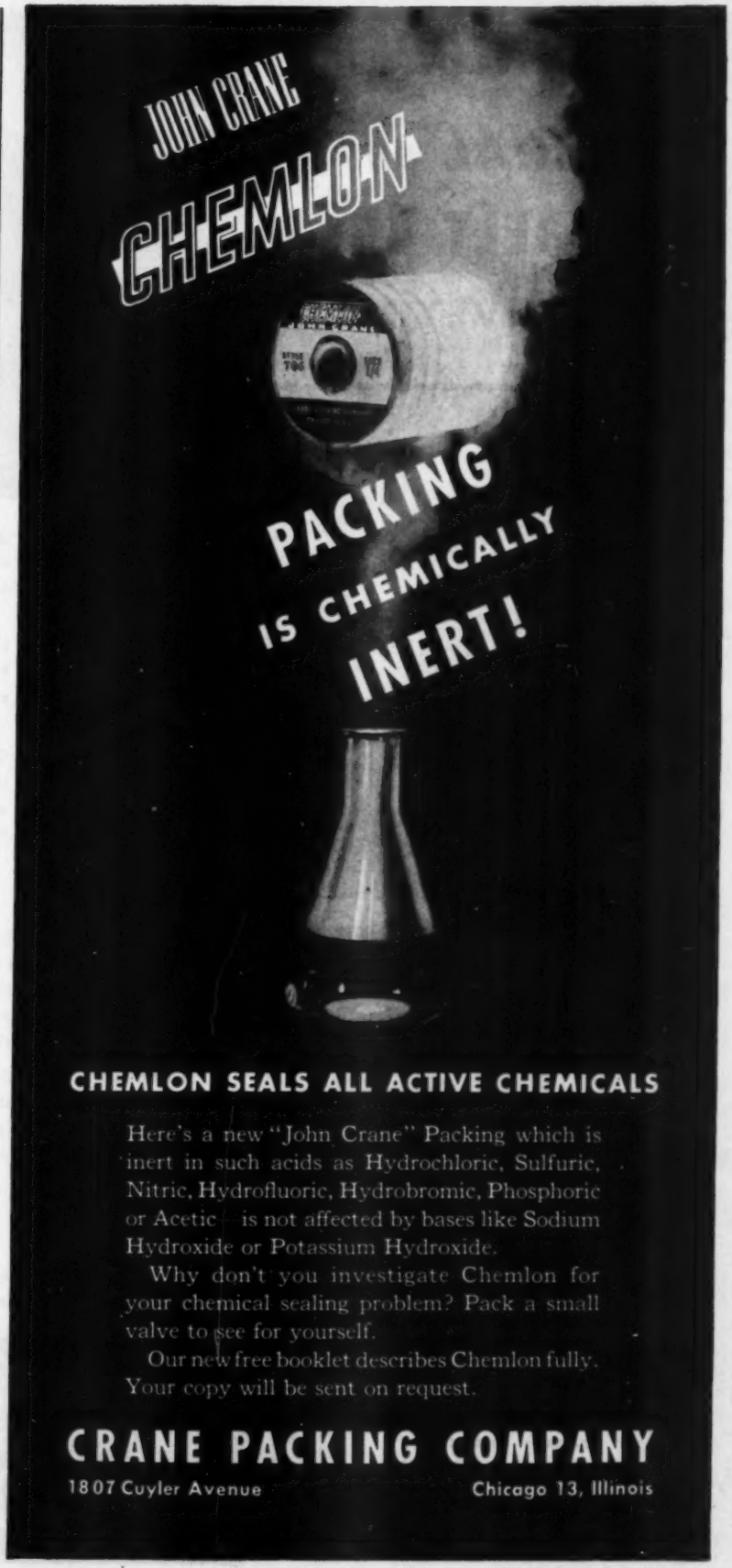
CONTAINER PLANT PLANNED BY LONGVIEW FIBRE CO.

Plans to build a new corrugated shipping container plant in Oakland, California, have been announced by the Longview Fibre Company, Longview, Washington. The investment will be something over $500,000. Ground has been broken for a 120,000 sq ft building, which will be ready for occupancy toward the end of the year. The new plant will use kraft containerboard supplied from the company's Longview mill.

Omer Denny, for many years manager of sales in northern California, will be plant manager at Oakland. Fred H. Clewley, formerly in charge of the Seattle district sales, has been named northern California sales manager, and Morey Williamson has assumed the Seattle sales management post.

▼

▶▶▶ A CHIP STORAGE silo of reinforced concrete, 70 ft high with a diameter of 40-ft, is being constructed for Bird & Son, Inc., at Phillipsdale, Rhode Island, by The Rust Engineering Company, Pittsburgh, Pennsylvania. The new project, which also will include a conveyor to the wood preparation department, will make possible sufficient storage of wood chips to eliminate operating the chipper 16 hours a day, as is necessary at present.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CHEMLON
PACKING
IS CHEMICALLY
INERT!
CHEMLON SEALS ALL ACTIVE CHEMICALS
Here's a new "John Crane" Packing which is inert in such acids as Hydrochloric, Sulfuric, Nitric, Hydrofluoric, Hydrobromic, Phosphoric or Acetic — is not affected by bases like Sodium Hydroxide or Potassium Hydroxide.
Why don't you investigate Chemlon for your chemical sealing problem? Pack a small valve to see for yourself.
Our new free booklet describes Chemlon fully. Your copy will be sent on request.
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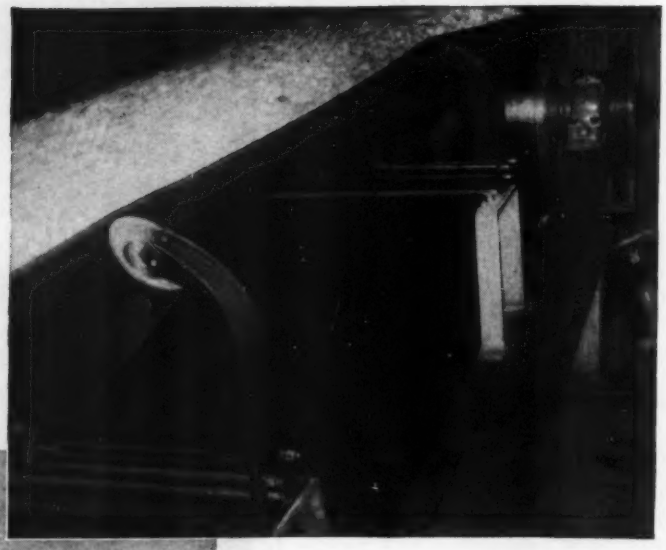
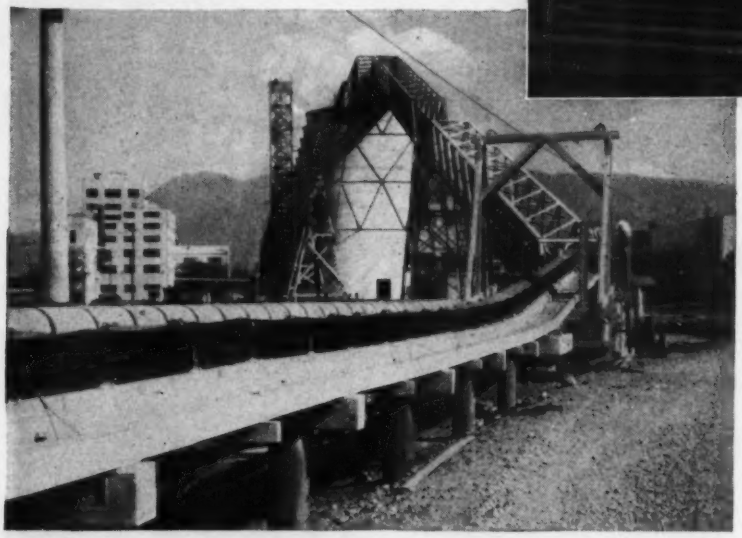
MOVE MORE MATERIAL on LINK-BELT 45° BELT CONVEYOR IDLERS →

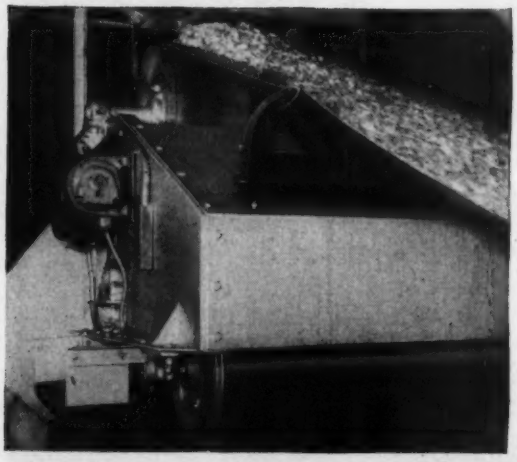


Illustrating the high capacity obtainable with 45° idlers without spillage.



Equipped with 45° idlers, this 24 inch wide belt conveyor handles wood chips from chipper to storage bins.

Greater all-round efficiency of belt conveyors is reported by mills, where Link-Belt 45 degree troughing idlers have been in use for the past several years.



45° idler forming part of Link-Belt motor driven tripper on 48 inch wide belt conveyor delivering wood chips to storage bins.

The carrying capacity for a given belt width is increased, or a narrower belt can be used to handle a given volume. With self-aligning idlers installed at recommended intervals, the belt is protected and preserved from damage, excess wear, spilling or below-capacity loading, due to misalignment.

Link-Belt 45° troughing idlers are available in two styles: with *unequal length rolls*, the center roll being longer than the two end rolls, the latter being of equal length, and with *equal* length rolls, where all three rolls are of equal length.

The unequal length idlers accommodate belt widths up to 60 inches. The equal length idlers accommodate belts up to 72 inches wide.

Let Link-Belt engineers show you how the 45° troughing idlers can increase your handling capacity and reduce costs.

YES! GO WEST!
PORTLAND, OREGON
1949 FALL MEETING TAPPI—SEPT. 12-16

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices in Principal Cities. 11,309

LINK-BELT

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BELT CONVEYOR EQUIPMENT

IDLERS • TRIPPERS • BELTS • PULLEYS • BEARINGS • DRIVES

Allied . . . . . .

ELECTRO-CHEMICAL SUPPLY AND ENGR. CO. REORGANIZED

A complete reorganization of the Electro-Chemical Supply and Engineering Company of Paoli, Pennsylvania, has been effected. Furthermore, in addition to existing facilities, a new plant with 16,000 sq ft of floor space has been fully equipped at Emmaus (Allentown), Pennsylvania. It went into operation the first of July.

Dr. C. R. Payne

The new officers of the company are: Dr. C. R. Payne, president; J. William Grant, vice president and sales manager; William A. Sesher, treasurer and production manager; Walter L. Sheppard, Jr., advertising manager and export sales manager.

The Electro-Chemical company was founded in 1912, and was one of the first companies in the United States established to manufacture acid proof cements, and to engineer acid proof construction.

▼

FAIRBANKS, MORSE NEW CHICAGO HEADQUARTERS BUILDING IS UNDER WAY

A new building to house the Chicago branch of Fairbanks, Morse & Company is now under construction and is expected to be completed by the end of this year.

The new structure, with the site, represents an investment in excess of $500,000. The location is 1544-1558 South State Street. The new building will be of modern architecture of fireproof materials, automatically heated and air conditioned. The building will be one story, 145 x 250 ft, fronting State and 16th Streets. It will house the sales and service personnel along with warehousing and repair facilities for the company's operations in the Chicago area.

Features of the office portion of the building will be in-the-wall filing cabinets and baseboard heating.

▼

GEO. F. HARDY & SON HAS DISCONTINUED ITS BUSINESS PERMANENTLY

With a record of nearly fifty years of continuous service to the paper industry, George F. Hardy & Son, mill architects and consulting engineers, New York City, closed its doors permanently on August 1.

The business is discontinued because of health reasons, according to announcement given the trade by John A. Hardy. It is stated that all current contracts have been completed and new work pending has been declined.

▼

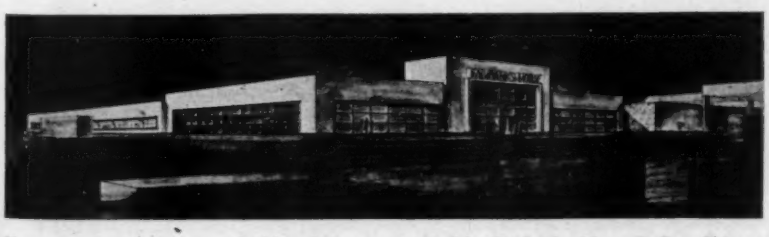
SANDY HILL GETS ORDER FROM ITALIAN COMPANY FOR PAPERMAKING EQUIP.

Contracts covering more than a million and a half dollars worth of papermaking equipment have been signed by the Sandy Hill Iron & Brass Works and Cartiere Burgo of Milano, Italy. (Cf. P.I. and P.W. July, 1949, p. 501)

The project, a part of Italy's industrial recovery program, is expected to aid in Italy's exports, reducing costs and improving labor efficiency.

The Sandy Hill Iron & Brass Works completed its first contract with Cartiere Burgo in the late spring. At that time, Kenneth L. Seeber, erection supervisor at Sandy Hill, went to Italy to see a selective drive installation placed in operation in one of the Cartiere Burgo mills. The large Italian firm already had advanced plans for rebuilding and modernization work in the eleven pulp and paper mills it owns. As a result, their engineer, Piero Bersano, arrived at Sandy Hill to begin preliminary negotiations soon after Mr. Seeber's return to Hudson Falls.

It is estimated that some 400,000 man hours of labor will be involved in the engineering and building of this equipment. Sandy Hill officials state that it will provide approximately 125 days of work for 400 people.



Shown in perspective is new building being constructed by Fairbanks, Morse & Co., Chicago

▼

RETIRED EMPLOYEES CLUB DEDICATED BY FARREL-B

Because industrial relations seldom extend to those retired from active employment, considerable attention has been focused on facilities that have recently been created for the newly formed "Farrel - Birmingham Retired Employees Club."

Franklin Farrel, Jr., presents Norman Knight with first card of membership in Farrel-Birmingham Retired Employees Club

Area for two spacious rooms was provided when Farrel - Birmingham Company, Ansonia, Connecticut, converted a former pattern shop building into quarters now largely used for offices. The club-room appointments are comparable to those of the finest social clubs and furnishings include deep-cushioned, leather-upholstered lounges and chairs, well supplied book shelves, and table-game paraphernalia for passing time pleasantly.

At a dedicatory luncheon, well attended by those eligible for membership in the new organization, Franklin Farrel, Jr., director of the company and former chairman of the board, presented membership cards and denoted his satisfaction in "fulfilling a plan we have long had in mind."

▼

▶▶▶ COMPLETE CONTROL of the Chicago Automatic Stoker, a spreader type stoker with over 20 years of successful performance behind it, has re-

cently been acquired by The Standard Stoker Company, Inc. The products will continue to be known as the Chicago Automatic Stoker and will be completely made in Standard's modern plant at Erie, Pa.

▼

NEW NATRIUM PLANT OF COLUMBIA CHEM. DIVISION IS PLACED IN OPERATION

Under construction for more than a year, the chlorinated benzene producing plant of the Columbia Chemical Division of Pittsburgh Plate Glass Company at Natrium, West Virginia, is now in operation.

The estimated cost of this plant is more than a million dollars—it adjoins a large chlorine and caustic soda producing facility constructed during the early war years. Produced here will be monochlorbenzene, muriatic acid, paradichlorbenzene and orthodichlorbenzene as co-products in a continuous chemical process. Production of the chlorinated benzenes, basic chemicals in the organic field, marks the Columbia Chemical Division's entry into the field of organic chemical compound production.

Situated on the Ohio River approximately 30 miles south of Wheeling, Columbia Chemical Division's chlorine-caustic soda plant first went into production in July, 1943, when a critical, wartime shortage existed in these basic chemical products.

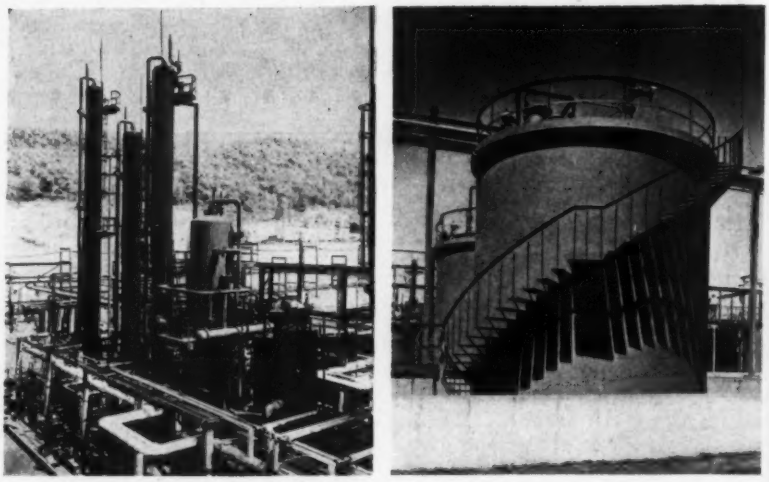
One of the largest chlorine producing plants ever built as a single unit, the Natrium chlorine production facilities last year were increased by 25 per cent. Salt brine, the raw material from which chlorine and caustic soda are obtained by electrolytic decomposition, is pumped up to the Natrium plant from mile-deep salt wells—the deepest salt wells in the country.

▼

HARRIS-SEYBOLD OFFICERS TOUR EUROPE TO OBSERVE GRAPHIC ARTS INDUSTRY

Officers of the Harris-Seybold Company, Cleveland, Ohio, have been traveling in Europe this summer for a first-hand glimpse of postwar recovery in the foreign graphic arts industry. Chairman of the board, R. V. Mitchell, and the company's vice president in charge of engineering, C. W. Harrold, will visit London, Oslo, Stockholm, Copenhagen, Amsterdam, Brussels, Paris, Milan, Rome, Lausanne, Berne, Zurich, and the United States zone of Germany and Austria.

On the continent, they will join forces with L. R. Beck and Frank Gilbert, Harris-Seybold export manager and service representative respectively, who have been in Asia and Europe for two months on a survey of printing and publishing conditions abroad.



Fractionation towers (left) rise above the new Natrium (W. Va.) chlorinated benzene producing plant just put into operation by Columbia Chemical Division of Pittsburgh Plate Glass Co. Large tank (shown at right) is for storage of benzene

▼

$2,000,000 GLASS FACTORY READY FOR G-E OPERATION

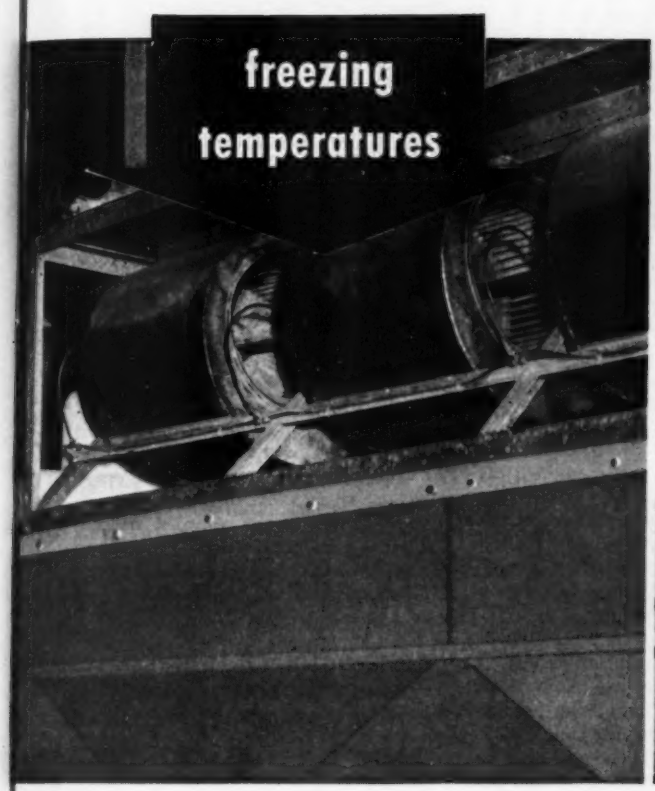
A $2,000,000 glass factory which will manufacture glass parts for incandescent and fluorescent lamps has been completed at Logan, Ohio, for the General Electric Company by The H. K. Ferguson Company, industrial engineers and builders. The plant will employ about 200 persons at peak levels of operation.

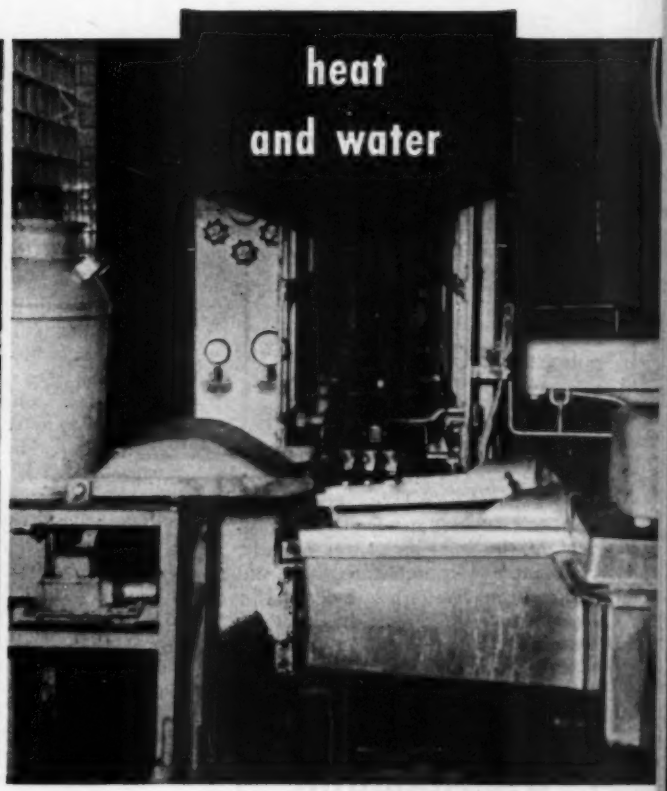
The main building, 320 x 500 ft., houses two gas-fired glass furnaces, one for lead glass and one for lime glass. Raw materials are fed into the furnaces by conveying equipment and mechanical feeders from an adjacent mixing room. The glass tubes are made by an automatic horizontal draw process.

Part of the one-story, steel-frame, brick structure will be given over to offices, a cafeteria, a dispensary, and locker and toilet rooms. All of these areas are air conditioned and have

"Welcome to London" handshake greets R. V. Mitchell (left), chairman of the board of Harris-Seybold Company, upon his arrival in England. Greeter is R. R. "Kim" Horne (right), head of Smyth-Horne, Ltd., British representative for Harris-Seybold

Here's ONE grease that withstands





Bearings in electric motors and fan shafts in a midwest cold storage plant are exposed to storage-room temperatures of 32° down to −10° F. The grease, applied by pressure gun, has to flow through ¼" copper tubing to reach the bearings. At the low temperatures, conventional greases continuously gave application and lubrication troubles.

The problem was solved by Stanolith. Despite freezing temperatures, this unique product flowed readily through the tubing and provided safe lubrication for the bearings.

Bearings in the can-washing equipment shown above are subjected to the severe washing action of water at near-boiling temperatures of 180° to 200°F. This combination of heat and water proved too severe for conventional greases and posed a lubrication problem in this midwest plant.

At the suggestion of a Standard Oil Lubrication Engineer, the job was given to Stanolith Grease, a lithium soap product with the unique ability to withstand both heat and water.

In six months' service, Stanolith has provided trouble-free lubrication for the bearings. Moreover, Stanolith has been used successfully for lubrication of bearings in the plant's electric motors and conveyor systems. Its versatility has eliminated the cost and trouble of stocking special lubricants.

Stanolith Grease

If heat, water, or low temperatures interfere with proper lubrication in your plant, try Stanolith Grease. A Standard Oil Lubrication Engineer will be glad to give you more information about this versatile product.

Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD

acoustical ceilings and troffered fluorescent lighting fixtures and terrazzo or asphalt tile floors.

Steam for heating is supplied by two coal-fired boilers, with space provided in the boiler house for an additional unit, should it be required later. The plant also has its own sewage disposal facilities.

Ferguson engineers encountered special ventilation problems in exhausting combustion gases from the glass furnaces and in dissipating the large quantities of heat generated by the processing machines. Equipment capable of moving 200,000 cu ft of air per minute was installed in the processing area to draw off heat and maintain an even temperature. Fluorescent lighting is used throughout the building.

▼

HANCHETT MFG. COMPANY EXPANDS PLANT FACILITIES

Hanchett Manufacturing Company of Big Rapids, Michigan, is doubling its manufacturing capacity according to Kent S. Hanchett, newly elected president of the company. Until recently, Hanchett also manufactured and sold various large surface grinders. This line of grinders, however, has been discontinued and the company is concentrating on improving and increasing the production of their complete saw and knife fitting equipment.

Because of this expansion, the manufacturer states that immeditate delivery of many items is now possible, and delivery of almost any machine can be made within four to eight weeks.

Simultaneously, it was announced that the following new officers were elected: Fred C. Schaub, vice president; Loren B. Hanchett, secretary; Carl L. Moline, treasurer; Frederick M. Risler, general sales manager.

▼

SPROUT-WALDRON MAKES CHANGE IN P&P DIVISION

Effective July 1 and coinciding with the resignation of Frank C. Vaughn as manager of its Pulp and Paper Division, Sprout, Waldron Company announces that the sale of its popular 36-2 Refiner is going to be handled exclusively in the New England states and the southeast by its representative, Thaxter W. Small, with headquarters at Valdosta, Georgia. William Converse will have charge of the sale of the refiners in the balance of the United States. Mr. Converse has been representing the Sprout, Waldron Company for the past several months in the middle west and, for the time being, will continue to make his headquarters in Appleton, Wisconsin.

In making this change the Sprout, Waldron management explains that it has as its objective the streamlining of its sales contacts with the pulp and paper industry and the furthering of its services to that industry.

▼

▶▶▶ A NEW SALES OFFICE, located at 250 Boylston St., Boston, has been opened by The Babcock & Wilcox Tube Company. The new office intends to offer improved sales and service to the New England area and will be under the direct supervision of J. W. Bramley (see Names in the News).

▼

AMER. CYANAMID RENEWS CHEMISTRY SCHOLARSHIPS

Renewal of fifteen scholarships for the academic year 1949-50, chiefly in the fields of chemistry and chemical engineering, has been announced by the American Cyanamid Company. Generally these scholarships provide $1,500, and are awarded to graduate students in their last year of pre-doctoral study. Recipients of post-doctoral scholarships receive $3,000.

Scholarships have been established at Brown University, Massachusetts Institute of Technology, Columbia University, Princeton University, University of Virginia, Pennsylvania State College, Cornell University, University of Illinois, University of Notre Dame, University of Michigan, University of Wisconsin, University of Minnesota, University of Colorado, and Purdue University.

▼

BROWN INSTRUMENTS DIV. BEGINS TRAINING SESSIONS

A comprehensive 13-week course and two five-week courses, scheduled for the period from August 15 to December 2, have begun sessions at the Brown Training School of Industrial Instrumentation, Brown Instruments Division of Minneapolis - Honeywell, Philadelphia. As in the past, the courses are designed primarily for customers, in order that they may obtain maximum benefit from their Brown process control equipment.

The industrial instrument maintenance and repair courses are covering all classifications and types of industrial instruments. The addition and opening of a new factory to the main Philadelphia plant of the company has enabled the training school to move to the plant annex where it occupies double the facilities previously available.

▼

G-E BROCHURE FEATURES ELECTRIC LOCOMOTIVES AS USED IN PAPER MILLS

The latest issue of General Electric's brochure "Industrial Locomotives" is devoted entirely to diesel-electric locomotives now being used in the paper and lumber industries. This is an attractive 8½ x 11 publication giving some impressive statistics about the savings, both in time and money, effected at paper mills and lumber companies by the use of diesel-electric switch engines in various size mills. In addition, the safety and cleanliness factors are stressed.

The paper firms featured with page spreads are: Southland Paper Mill, Lufkin, Texas; The Northwest Paper Company, Cloquet, Minnesota; and the Nekoosa-Edwards Paper Company's mill at Nekoosa, Wisconsin.

▼

▶▶▶ THE ADDITION of the Cochrane C-B Condensate Drainage Control System to the line of Cochrane Corporation (Philadelphia) products now handled by the Frederick H. Mason Company, Detroit, was recently revealed. The Mason Company has been the sales and engineering representative for Cochrane in the Michigan territory and around Toledo since 1900 for deaerating feedwater heaters, water softeners, and industrial water conditioning specialties.

Use Anthrafilt*

To Solve Your Filter Problems

1. Increase your filter plant output without increasing the size of your present plant.

2. ANTHRAFILT, the hard coal filter medium will increase rates and lengths of filter runs.

3. Weighing only about one half as much per cubic foot as other types of filter media ANTHRAFILT backwashes at lower rates.

4. Being essentially a carbon you can filter sanitary supplies, hot or cold process water or acid and alkaline solutions.

Many paper mills in all sections of the country now use ANTHRAFILT exclusively. Why not write us today for full details, test samples, recommendations and quotations?

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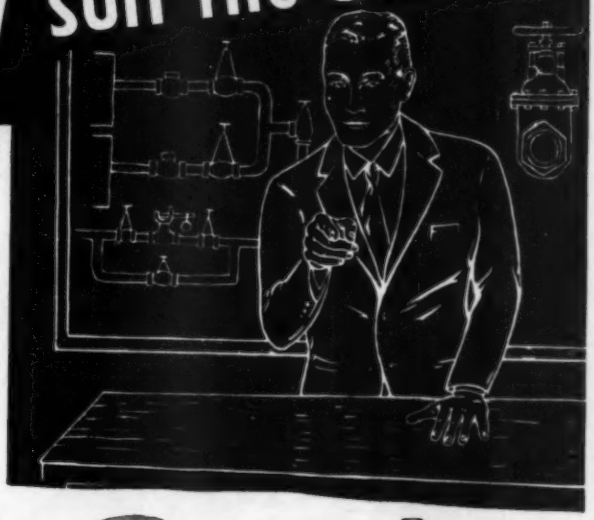
1st Lesson in Flow Control – the Valve *MUST* suit the Service



It's an established fact that there's more loss in time and money through misapplication of valves than from any other known cause.

Fortunately this can be avoided. All you need to do is standardize on the Powell Line of Valves*—because this is what you get—

I More varieties and patterns than are made by any other manufacturer of valves.

II The most complete line of Standard Designs, made of standard materials, for use wherever they fill the requirements of the service.

III Many Special Designs for Special Services.

IV Valves made in the greatest variety of materials ever used in making flow control equipment.

With such facilities at your disposal and Powell Engineers always ready to help you select the right valves, why take chances with your flow control equipment. Standardize on POWELL VALVES.

*** Powell Valves are made in Bronze, Iron, Steel and a wide selection of Corrosion-Resistant metals and alloys. Valves of every type—Globe, Angle, Gate, Check, Non-return and Flush Bottom Tank Valves—are included in the Complete Powell Line.**

Fig. 1847 — 200-pound Stainless Steel Swing Check Valve. Screwed-in cap and regrindable, renewable disc.

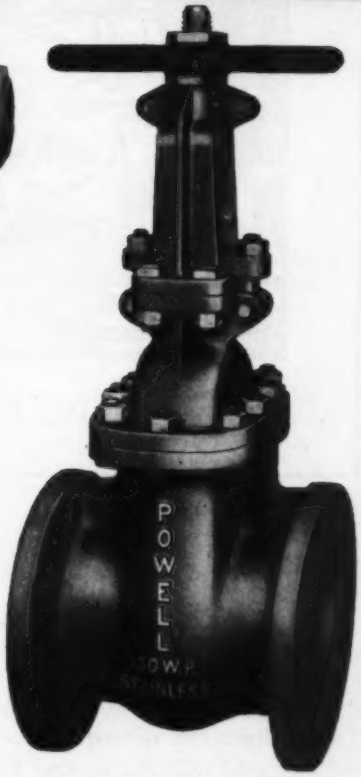


Fig. 2453-G—Large 150-pound Stainless Steel Gate Valve. Bolted flanged yoke-bonnet, outside screw rising stem and tapered solid wedge. Made in sizes 5" to 30", inclusive.

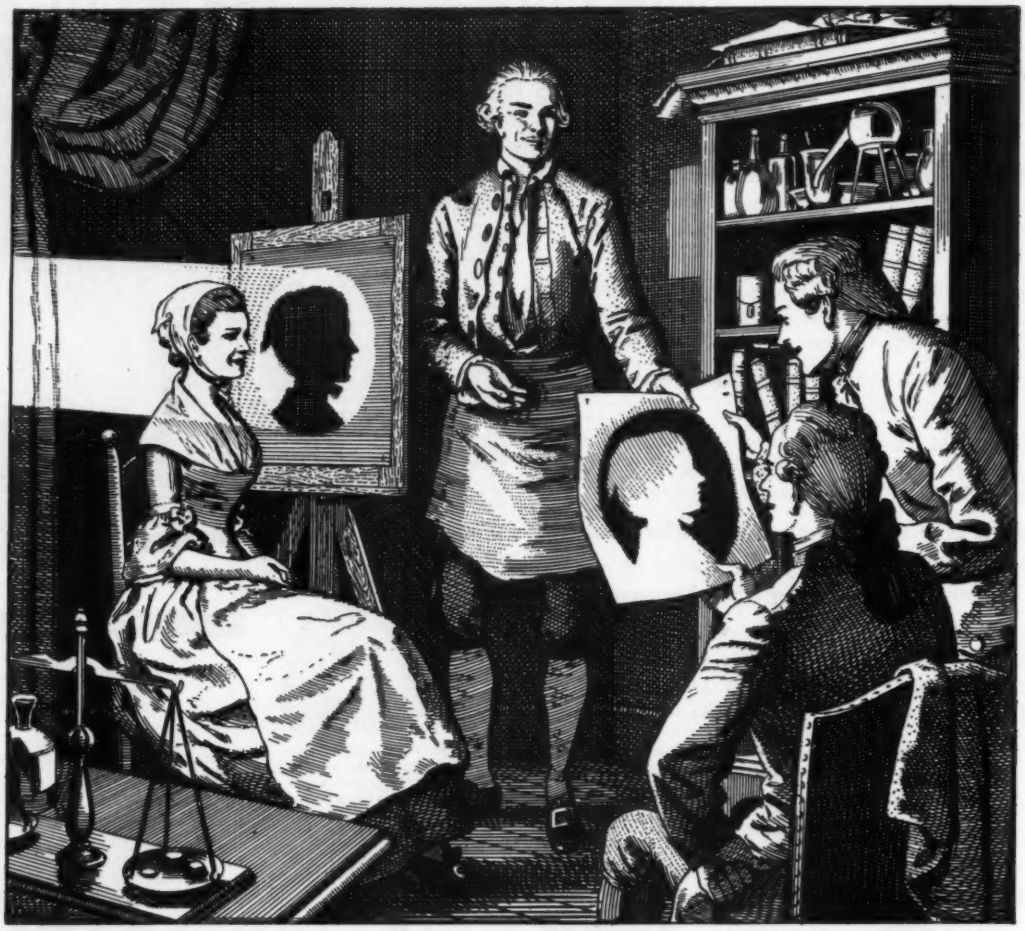
Fig. 241—125-pound Iron Body Bronze Mounted Globe Valve with outside screw rising stem, bolted flanged yoke, regrindable, renewable bronze seat and disc.

Fig. 150—150-pound Bronze Globe Valve with screwed ends, union bonnet and renewable composition disc.

Fig. 375 — 200-pound Bronze Gate Valve. Screwed ends, union bonnet, inside screw rising stem and renewable "Powellium" wear-resisting nickel-bronze disc.

The Wm. Powell Co., Cincinnati 22
DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES



The Secret Born in a Darkroom

In 1802 two Englishmen—Thomas Wedgwood and Sir Humphry Davy—published a paper that was to make history. They described how, in a darkened room, they had made profiles by casting shadows on paper moistened with nitrate of silver. But when exposed to light the silhouettes soon disappeared. Not until 1835 did another Englishman, W. H. Fox Talbot, devise a way to make a photographic image permanent. And it was more than a half-century later that George Eastman introduced his first small hand-held camera, followed it with transparent, flexible roll film and special papers, and made photography available to all.

Modern photography has vastly expanded printing and publishing, and has increased enormously the uses of paper in business, education, government, science, and the arts. Thus the secret born in a darkroom greatly stimulated the growth of America's paper industry.

The dramatic story of paper is told in the sound-and-color film, "Paper—Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

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KENWOOD WOOL PRODUCTS

HUYCK *Felts*

Names in the News...

MANDO ADVANCES FOUR

The Minnesota and Ontario Paper Company announced recently the appointment of M. S. Wunderlich, director of research, to Mando's Operating Committee, an advisory board to the president regarding operating policies and problems. This appointment, plus other personnel shifts, it is said, will strengthen the research department and make possible a more effective coordination of research activities with those of other departments.

M. S. Wunderlich

Robyn A. Campbell

Other organizational changes in the research department involve the appointment of Robyn Campbell to assistant director of research in charge of pulp and paper, and the promotion of George H. McGregor to supervisor of pulp, paper, and by-products research at the International Falls Laboratory.

Mr. Campbell was formerly assistant to the vice president in charge of production and more recently assistant paper sales manager. He joined Mando in 1947, having previously held the position of assistant general manager of the Blandin Paper Company.

Geo. H. McGregor

Gilbert Stevens

Mr. McGregor's promotion broadens his responsibility to include paper research. Previous to joining Mando, he was chief chemist with the Northwest Paper Company for five years, and was general pulp superintendent of the pulp division of Weyerhaeuser Timber Company at Longview, Washington.

Gilbert Stevens has been appointed sales and service representative of Mando's paper sales division. Mr. Stevens joined Mando in 1940 and has since served in various capacities in sales and the research departments.

▼

EASTMAN PROMOTES FIVE KODAK PARK EXECUTIVES

Promotion of five Eastman Kodak Company executives was announced recently by Charles K. Flint, vice president and manager of Kodak Park, where all the changes were made:

Donald B. Kimball, assistant general superintendent of paper departments since 1947, became general superintendent.

John P. Helphrey, Jr., took over as assistant general superintendent of paper departments. He had been assistant superintendent in charge of development and production of photographic paper emulsions since 1936.

Francis B. Thorne and John L. Patterson became assistant superintendents of the chemical plant.

Joseph F. Burns is the new purchasing agent at Kodak Park.

▼

W. W. WEBER RETIRES FROM FOREST PRODUCTS LAB.

Rounding out a quarter of a century on the staff of Forest Products Laboratory, Madison, Wisconsin, Wallace W. Weber has announced his retirement as chief of the Division of Information and Education.

Mr. Weber actually has had 36 years of service in the Forest Service, which operates the laboratory at Madison, since becoming a forest ranger in Oregon shortly after graduating from the University of Michigan in 1912. Leaving the supervisorship of the St. Joe National Forest in 1923, Mr. Weber took over as manager of the laboratory's then extensive work in technical courses such as kiln drying and gluing. Hs assumed direction of the publication activities early in World War II with the retirement of Edgar F. White.

A number of articles authored by Mr. Weber have appeared in this magazine.

Succeeding Mr. Weber as Information and Education chief at the laboratory is Donald G. Coleman, staff editor for the past 21 years.

McCANN & HULL PROMOTED BY PEERLESS PUMP DIVISION

Changes in the sales department of the Peerless Pump Division of Food Machinery and Chemical Corporation, Los Angeles, California, recently announced affect the New York and Indianapolis offices of the company.

Frank W. McCann, previously head of centrifugal pump sales at the Indianapolis, Indiana, works, has been appointed manager of Peerless' Atlantic

Frank McCann

Bob Hull

district sales with headquarters at 37 Wall Street, New York City. The territory served by Mr. McCann includes all New England and Middle Atlantic states.

Robert H. Hull has replaced Mr. McCann at Indianapolis. Mr. Hull assumes new duties of sales manager of Peerless' engineered pump lines, including both vertical type pumps and horizontal centrifugal pumps. Mr. Hull previously was located at the company's Los Angeles works in charge of sectional sales of the vertical pump line.

▼

▸▸▸ *R. Jack Manning,* of the sales division of the Du Pont Company's ammonia department, has been transferred from Wilmington to New England to work more closely with the paper, textile, and leather industries. He will make his headquarters in Needham (Mass.), in covering the six-state area.

▼

TWO ADVANCED TO A VICE PRESIDENCY BY WORTHINGTON

John J. Summersby has been elected vice president in charge of sales, and Thomas J. Kehane has been elected assistant vice president and general sales manager by the board of directors of Worthington Pump and Machinery Corporation, Harrison, New Jersey.

Mr. Summersby joined Worthington's Cincinnati Works in 1916 as a student engineer. In 1919 he was assigned to the St. Paul district office as a salesman and later was made district sales manager. From 1929 to 1931 he was sales manager of the Holyoke Works, assistant general sales man-

ager from 1931 to 1934, and since, assistant vice president and general sales manager.

Mr. Kehane joined Worthington in 1915 as a 14-year-old office boy. Since then he has advanced through various positions in the Sales Department, and in 1944 he was appointed commercial vice president for the Pacific coast. For the past two years he has served as Pacific coast regional vice president of the Navy Industrial Association. He is widely known in the public utility and petroleum industries.

▼

PALMER J. LATHROP IS THE NEW PRESIDENT OF CAMERON

At a special meeting held July 7, the board of directors of the Cameron Machine Company, Brooklyn, New York, elected Palmer J. Lathrop president of the company.

Mr. Lathrop has been actively associated with Cameron since September, 1948, and has been a member of the board for several years. He succeeds the late Harold Kinsey, who passed away June 25 (see Necrology).

Mr. Lathrop was formerly associated with Bristol-Myers Company as vice president in charge of production. He is a graduate of Princeton University and served in the Air Corps during World War II with the rank of major.

Palmer J. Lathrop

Anthony J. Wirpsa

WIRPSA TO DEVELOP USE OF CHEMICALS FOR P&P MILLS AT HOUGHTON CO.

E. F. Houghton & Company, Philadelphia, has acquired the services of Anthony J. Wirpsa as supervisory chemist in the paper products division. Mr. Wirpsa will head a program to develop the use of chemicals in pulp and paper mills, as part of Houghton's planned expansion in that field.

A graduate of New York State College of Forestry, Mr. Wirpsa has an extensive background in paper mill work. Before joining Houghton, he served 12 years with the Racquette River Paper Company, Potsdam, New York, as research chemist. Prior to that he was with the United States Forestry Service in Wisconsin for two years.

THOMAS McMURRAY MADE A SALES MANAGER BY THE CRYSTAL TISSUE COMPANY

The promotion of M. Thomas McMurray to the position of sales manager of mill products has been announced by The Crystal Tissue Company, Middletown, Ohio.

After serving in the Navy in World War II, Mr. McMurray joined the sales staff of the Crystal Tissue Company and was made assistant sales manager in 1948, a position he held until his present appointment. In his new capacity, he will direct the sales of all mill products for the company throughout the United States and abroad.

▼

▶▶▶ *T. Raymond Pierce* has retired as vice president of the Robert Gair Company, Inc., New York, New York. Mr. Pierce, who has been associated with the Gair company for more than 20 years, will continue as a member of the board of directors.

▼

▶▶▶ *Joseph V. H. Hayes,* treasurer of John A. Manning Paper Company, Inc., Green Island, New York, who retired July 1, will be succeeded by Arlie G. Smith, who was elected treasurer and assistant secretary at a quarterly meeting of the board of directors. Mr. Hayes will continue to serve on the board of directors. At the same meeting, James F. Adams was elected president and William H. Manning, secretary.

▼

▶▶▶ *Vincent V. Lindgren* has joined the new product development department of the American Cyanamid Company, and will devote his time to the development of new products. He has been associated with the company for the past three years in its Stamford Research Laboratories.

B. R. Putnam, Jr. has also joined this department, but will be concerned with market research activities. He was formerly engaged in engineering development in the company's technical department.

▼

PERSONNEL CHANGES ARE ANNOUNCED BY RYERSON

Joseph T. Ryerson & Son, Inc., Chicago, has announced the following executive changes:

William G. Findlay, former manager of the company's plant in Pittsburgh, has been transferred to Chicago as manager of the Work Order Division in charge of work order sales for the entire nation-wide group of 13 Ryerson steel-service plants. Mr. Findlay became associated with Ryerson 27 years ago, serving for 11 years as manager of the Work Order Department at the company's Detroit plant. He was appointed head of the Work Order Division at Chicago in 1939, moving to Pittsburgh as plant manager in 1947.

Wm. G. Findlay

A. L. Petersen

A. L. Petersen, former manager of the company's plant in St. Louis, has been transferred to Pittsburgh, succeeding Mr. Findlay as manager. Mr. Petersen joined Ryerson at Chicago in 1913, was transferred to the company's Detroit plant in 1919, and went to St. Louis in 1936 as assistant plant manager, moving up to the post of manager in 1938.

John M. Acee, former manager of sales at the Ryerson plant in St. Louis, has been named manager of that plant, succeeding Mr. Petersen. Mr. Acee has been with Ryerson since 1920. In 1929 he entered the alloy and stainless steel department of the company at St. Louis and was made head of the department in 1938. He became manager of sales at St. Louis in 1947.

John M. Acee

H. Homer Clark

CLARK SUCCEEDS COLLINS AS PURCHASE DIRECTOR FOR ANHEUSER-BUSCH

Assistant director of purchases, H. Homer Clark, has been appointed director of purchases for Anheuser, Busch, Inc., St. Louis, Missouri. He succeeds Burton W. Collins, resigned.

Mr. Clark got his start with the company as a yeast truck salesman 20 years ago. Shortly he was advanced to supervisor of yeast sales promotion, and in 1935 was promoted to manager of the office service department. In 1945, Mr. Clark spent 4½ months in Europe in the interest of the company's pharma-

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In bronze mounted patterns, rolled-in seat rings, integral non-corrodible stem thread bearing and special alloy stem assure longer life.

THE first clip type valve was originally developed many years ago by Lunkenheimer and was one of the most popular gate valves ever designed. As service demands became more severe, the basic design was improved into the present "King-Clip". Twenty-one different patterns are now available for a wide range of service conditions in virtually all industries.

The "King-Clip" is truly the leader of all clip type valves . . . it offers you a money saving solution to many valve problems. See your Lunkenheimer Distributor. He has a stock available to serve you promptly. Write for Circular No. 561.

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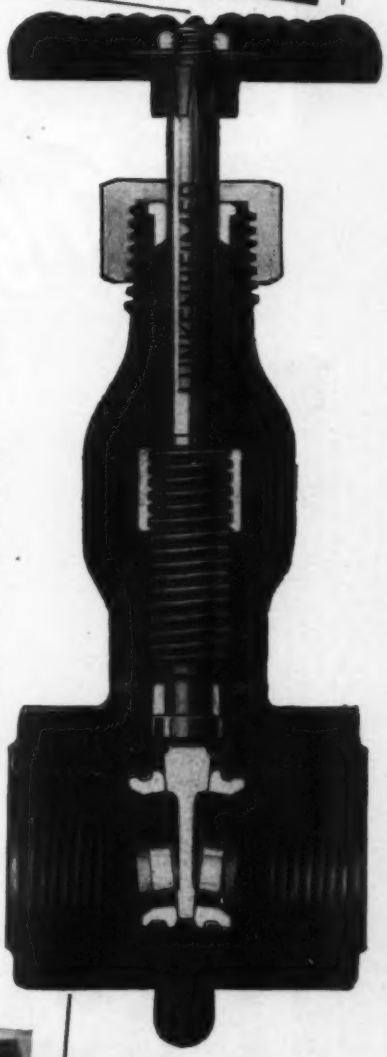

Fig. 1640 Iron Body Bronze Mounted . . . for steam, oil, gas, air, water & gasoline service.

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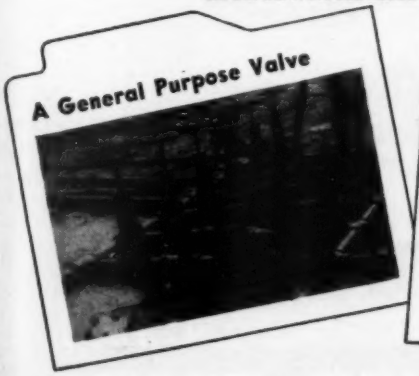

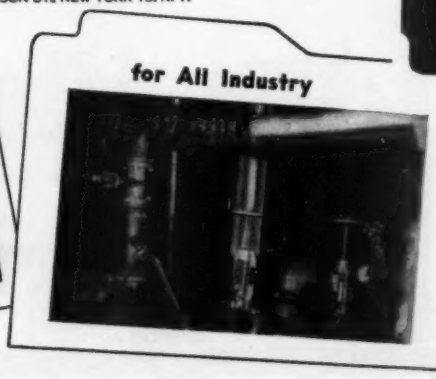

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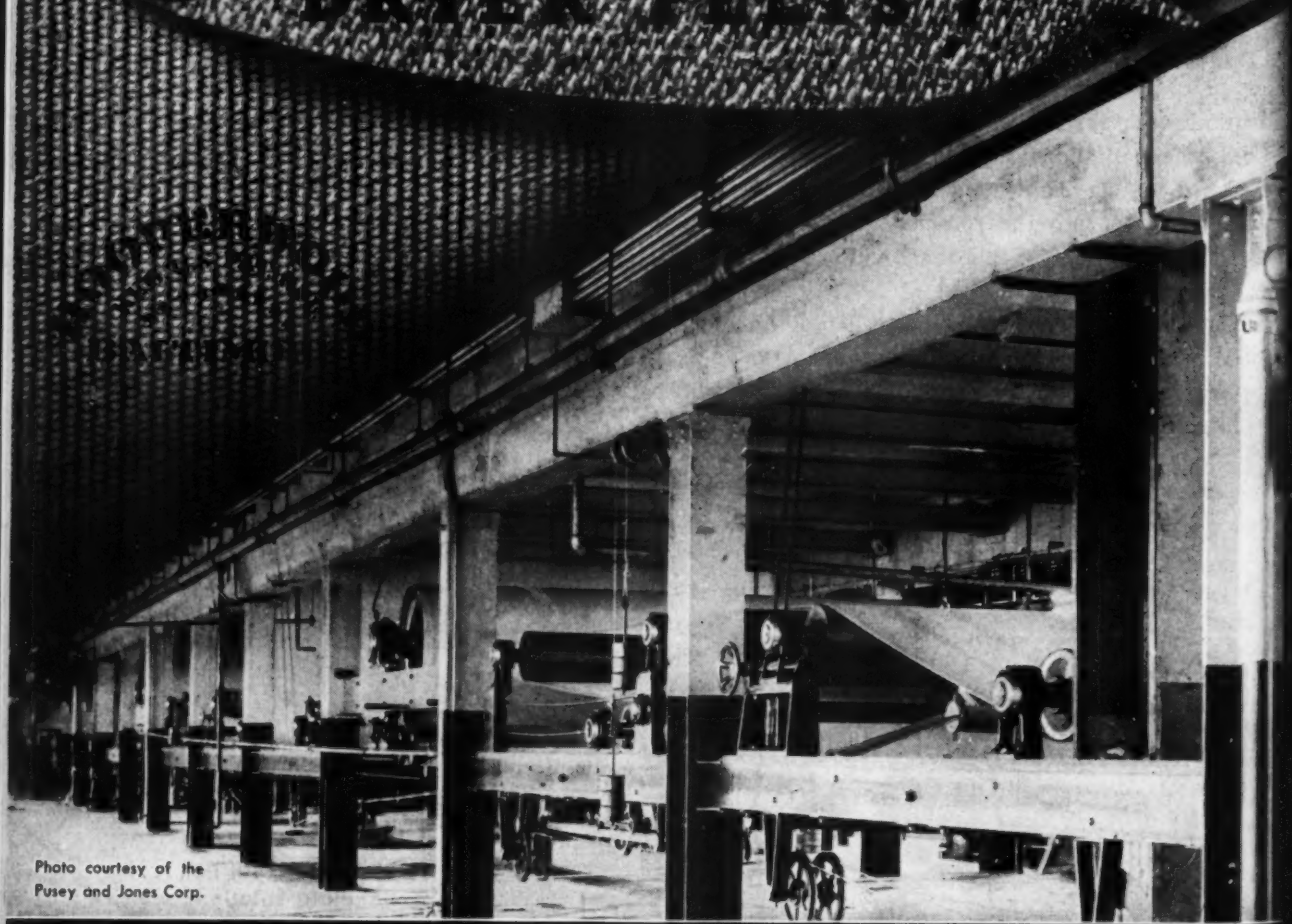

Photo courtesy of the Pusey and Jones Corp.

HOOPERWOOD DRYER FELTS

COTTON AND ASBESTOS

ceutical yeast, and in addition made large purchases of hops, supervising shipments through Czechoslovakia, Russia, and occupied Germany to Bremershaven. His appointment as assistant director of purchases followed in 1947.

▼

HENNING NOW IN ST. LOUIS SALES OFFICE OF CHAMPION

The appointment of Everett E. Henning to its St. Louis sales office has been announced by The Champion Paper and Fibre Company.

Mr. Henning is a native of the State of Washington. He began his long experience in the paper field in 1930 with the Zellerbach Paper Company, and, except for his four year World War tour of duty, was with them until 1946. He joined the Central States Paper and Bag Company of St. Louis as manager of the Fine Paper Department in 1946 and left them to become associated with Champion in June of this year.

Everett E. Henning

Sands G. Falk

FALK ANNOUNCES CHANGES

The Falk Corporation, Milwaukee, Wisconsin, has recently announced the appointment of Sands G. Falk as Manager of Foundry Sales, succeeding John S. Wilkinson, who will become Foundry Sales Consultant when he returns from a European trip October 1.

A graduate of the University of California, Mr. Falk has been associated with the company for 10 years. He has been assistant manager for the past five years.

Mr. Wilkinson joined the company in 1905 and has been active in Foundry sales more than 20 years. After he serves as a consultant for three months, he will retire at the end of this year.

▼

▶▶▶ *Lionel M. Goldberg,* vice president and director of National Container Corporation in charge of the Long Island City plant, has been elected comptroller and assistant treasurer of the company. Mr. Goldberg joined National Container in June, 1928, and was elected a vice president and director in 1937.

WITHSTANDLEY CAMERON'S NEW ADV. MGR.—OVERACKER TO HANDLE EXPORT SALES

Paul B. Withstandley has been named advertising manager for the Cameron Machine Company, Brooklyn, New York. Prior to joining Cameron, Mr. Withstandley did public relations and promotional work for Bristol-Myers Company, New York City.

Harold Overacker, who formerly was advertising manager for Cameron, will handle the company's export sales.

▼

MORE RESPONSIBLE WORK GIVEN TO EMMETT AND HAMACHER AT DETREX

Two executives at the Detrex Corporation were recently advanced to more responsible positions. R. A. Emmett, Jr., has been made a special assistant to the general manager to supervise material control, production scheduling, inspection, and safety.

J. Doyle Hamacher has been made superintendent of the equipment manufacturing plant, but will also retain his previous title and duties as company plant engineer.

▼

▶▶▶ *Harold L. Gruehn,* formerly sales representative in the Allis-Chalmers Milwaukee district office, has been named Midwest region dealer supervisor with headquarters in Chicago. Mr. Gruehn has been associated with the company since 1941, and since 1945 has been specializing in paper mill industry and franchise products in the Milwaukee district sales office.

▼

▶▶▶ *John P. McArthur* has been appointed by Worthington Pump and Machinery Corporation to the position of manager, West coast sales, with headquarters in San Francisco. Mr. McArthur joined Worthington in 1936 as an estimating engineer in the Philadelphia district office. He became sales engineer two years later and in 1945 was made manager of the San Francisco district office.

▼

▶▶▶ *J. W. Bramley* has been appointed manager of The Babcock & Wilcox Tube Company's new Boston District Sales Office, according to a recent announcement. Mr. Bramley was with the Lincoln Electric Company and J. E. Raney & Company, being associated the last nine years with their technical sales divisions in the New England district. He will have his headquarters in the Boston offices of Babcock & Wilcox at 250 Boylston St.

▶▶▶ *Harold W. Peck,* who has been associated with the Crown Zellerbach Division of the National Paper Products Company in Carthage, New York, for the past five years, has been appointed chief engineer of the Peter J. Schweitzer Company, Spotswood, New Jersey.

▼

▶▶▶ *William H. Compton,* who has served as manager of the Rockford, Illinois, sales office of The Reliance Electric & Engineering Company for the past four years, has been made Supervisor of Standard Motor Sales with headquarters in the company's general offices in Cleveland, Ohio. He is a member of the American Institute of Electrical Engineers.

▼

SIMMONS & LUNDIE NOW WITH JOHNSTON PUMP CO.

Important changes in personnel have recently been announced by the Johnston Pump Company of Los Angeles, California. T. W. Simmons, Jr., has been elected vice president and general manager of the company, Kenneth G. Lundie has been appointed general sales manager.

T. W. Simmons, Jr.

Kenneth G. Lundie

Mr. Simmons, until recently, was president of the Johnston Aquamatic Company of York, Pennsylvania. However, he has been identified for many years with the petroleum industry in California. Mr. Lundie was formerly western sales manager of the Pomona Pump Company, Pomona, California.

▼

MATOUSEK IS APPOINTED MGR. OF MANUFACTURING AT BAKER-RAULANG CO.

The appointment of John A. Matousek as manager of manufacturing of the Baker Industrial Truck Division of The Baker-Raulang Company, Cleveland, Ohio, has been announced recently. As such he will have charge of all manufacturing, purchasing, and engineering functions. Mr. Matousek has had nearly 20 years of experience in manufacturing management.

Other organization changes made recently by the company include E. H.

Remde, formerly works manager, to the newly created post of advisor to the president on engineering and manufacturing; H. A. Schultz, formerly superintendent, to manufacturing engineer, and I. L. Young to the position of general superintendent.

▼

▶▶▶ *Allen L. Spafford* has been appointed a field salesman in the territory comprising upper New York state and western Pennsylvania for the Hooker Electrochemical Company, Niagara Falls, New York. For the past two years he has been with the company as a process study engineer.

▼

▶▶▶ *George F. Cooper* has been named technical employment supervisor of the Hercules Powder Company Personnel Department, and will assume some of the duties formerly performed by Joseph M. McVey, who retired July 1. Mr. Cooper joined the company in 1940 as a supervisory trainee, and during the war was with the Hercules-operated Radford Ordnance Works, Radford, Virginia, as a supervisor in the manufacture of smokeless powder, and later as administrative assistant to the operating manager of that plant.

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VAN NORT RETURNS FROM EUROPEAN TRIP; REPORTS REVIVAL IN INDUSTRIES

Back from a five-week trip to England, Sweden, Finland, France, and the low countries, J. L. Van Nort, application engineer for The Reliance Electric & Engineering Company, reports that rehabilitation and modernization of European plants is proceeding rapidly in those steel, paper and textile industries where American machines, equipped with engineered drives and built-in precision electrical controls, are making possible higher operating speeds than manufacturers abroad have previously had available to them.

J. L. Van Nort

During his visits to many plants in England, and on the Continent, Mr. Van Nort had the opportunity to check on Reliance sales and service outlets and to renew acquaintance with outstanding European engineering firms. His itinerary was so arranged that he was able to be present in Kauttua, Finland, for the start up of the first Reliance-driven supercalender to be installed in the plant of the A. Ahlstrom Company, a leading Finnish paper mill since the end of the war.

Mr. Van Nort found a considerable revival underway also in the textile mills in France and Italy and a growing appreciation everywhere outside the Iron Curtain countries for American engineering and equipment.

▼

▶▶▶ *James F. Clark* succeeds Lester A. Blackford as treasurer of the American Car and Foundry Company, New York. Mr. Blackford has been with the company for 44 years and is retiring. Previous to his association with the company in 1948, Mr. Clark was an investment banker with Hemphill, Noyes and Company of New York, specializing in corporate finance, and during the war spent several years in Washington, first with Foreign Funds Control of the Treasury Department, and later as assistant to Rubber Director William M. Jeffers, and finally as director, Rubber Bureau, WPB.

▼

▶▶▶ *Robert L. Richards,* has been named general manager of Du Pont's Rayon Department, in Wilmington, Delaware, succeeding Benjamin M. May, who has retired after more than 46 years with the Du Pont organization. Mr. Richards started with the company as an operator at the Buffalo plant in 1923. After holding numerous positions, he was made assistant manager of the Rayon Department in March, 1946, and on January 1, 1947, he was made assistant general manager of the department.

▼

▶▶▶ *T. M. Robie,* who for the past several years has been manager of the Diesel Division of Fairbanks, Morse & Company with headquarters in Chicago, has now been appointed director of quality control for the firm's Beloit works in Beloit, Wisconsin. He has been succeeded by J. W. Wright, who more recently was manager of the company's Diesel Engine Sales Department at the Kansas City branch. Both Mr. Robie and Mr. Wright are well known in the diesel engine field.

▼

EDWARD ANDERSON WINS PROMOTION—BECOMES VICE PRES. OF ABSCO

The appointment of Edward R. Anderson as vice president of the Kellogg Division of American Brake Shoe Company, San Francisco, California, has been announced recently.

Mr. Anderson first joined ABSCO in 1930 and has been in the Engineering and Sales Departments of the Brake Shoe & Castings Division since joining the company. He became district sales manager of the Pacific District for this Division in 1947. He will continue to serve in this capacity in addition to his new duties.

▼

▶▶▶ *Gordon Urquhart,* a developer of the soybean material used effectively in fire fighting during the war and instrumental in the development of jellied gasoline used on aircraft carriers, has been appointed to the consulting staff of the Maneely Chemical Company, Wheatland, Pennsylvania. Mr. Urquhart is also on the chemical staff of America La France Foamite Company, and a director of American Fomon Company and other companies.

▼

HOWARD PUBLISHING CO. STAFF DUTIES DESIGNATED

The board of directors has named Joseph S. Peacock to manage over-all operations of the Howard Publishing Company following the sudden death on June 24 of its founder and president, Phil A. Howard. The company, which publishes trade papers in the paper and packaging fields including the monthly publications *The American Paper Merchant, The American Paper Converter,* and the *American Boxmaker,* will continue its operations unchanged, and long range plans for

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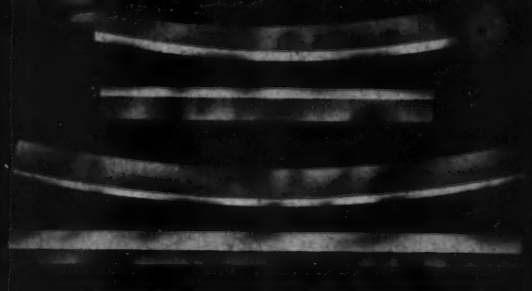

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Control Slime with—

PM 32 POWDER

Bactericide and Fungicide

Odorless—Safe
Efficient—Soluble

Mills using PM 32 Powder have reduced their costs of complete slime control to $.025—$.05 per A. D. ton in both Acid and Alkaline systems.

FALLS CHEMICAL PRODUCTS COMPANY
OCONTO FALLS, WIS.

improvement and expansion that Mr. Howard had under consideration at the time of his death will be carried out.

Mr. Peacock started with the company in 1937 as advertising manager. He left after three years, but returned in December, 1945, following three years as a Lieutenant in the Navy. He was named general manager in 1948.

Other key personnel will remain with the company. W. S. Young, Jr., business manager and secretary, has also been named treasurer. Mr. Young, who has been with the company since 1937, will continue to supervise the issuance of the two annual publications, *The Source of Supply Directory* and *The American Boxmaker Directory*.

L. Q. Yowell has been advanced from the position of managing editor to editor of *The American Paper Merchant*, meanwhile retaining the position of editor of *The American Paper Converter*. Mr. Yowell joined the Howard organization in 1945 after serving as associate editor of *Commerce Magazine*.

John W. Knight continues as editor of *The American Boxmaker*, a position he has held since he joined the staff in 1946. He was formerly the managing editor of *Shears* and *Packaging Parade* magazines.

Necrology . . . . . .

HAROLD CLYDE KINSEY

President of the Cameron Machine Company, Harold Clyde Kinsey, passed away June 25 at his home in Brooklyn, New York. Born in Philadelphia in 1882, Mr. Kinsey spent most of his life in the publishing business, first with John Wanamaker in Philadelphia, then with Doubleday Page & Company, and later with the Cosmopolitan Book Company, of which he was publisher. He resigned this position in 1932 to found the company which bore his name.

Harold Clyde Kinsey

Mr. Kinsey was for many years a director of the Cameron Machine Company, and in order to devote his full time to the machinery business during the war, sold his book business in 1943 to G. P. Putnam's Sons, and became president of the Cameron Machine Company. His daughter and a sister survive him.

▼

▶▶▶ *James M. Davidson,* superintendent of the Buffalo, New York, plant of Farrel-Birmingham Company, Inc., passed away July 15 following a brief illness. Mr. Davidson's entire business career was with the F-B Company, and his appointment to plant superintendent in 1946 climaxed his steady progress with the company from the time of his first employment as office boy in 1920. He is survived by his widow, a daughter, and three brothers.

▼

CHARLES H. MORSE III

An airplane accident claimed the life of Charles Hosmer Morse III, vice president in charge of manufacturing, Fairbanks, Morse & Company, Chicago, and eldest son of Colonel Robert H. Morse, president of the company, when the company's twin engine Lockheed plane crashed near Roanoke, Illinois, July 9, 1949.

"Hos," as he was best known by his friends and business associates, had been connected with Fairbanks, Morse since 1919. After holding various positions in the company's factories at Beloit, Wisconsin, Three Rivers, Michigan, Indianapolis, Indiana, and St. Johnsbury, Vermont, he was elected vice president in charge of manufacturing in June, 1946, with headquarters in Chicago.

Survivors are his widow, a daughter, two sons, and a brother.

▼

JAMES E. ALCORN

Following a period of ill health, James E. Alcorn passed away July 15 in Cleveland. Mr. Alcorn was vice president and manager and a director of the Alling & Cory Company in Cleveland, Ohio, and also president of the Paper & Twine Association.

Mr. Alcorn first entered the paper business in 1909 when he became associated with the firm of Chatfield & Woods of Pittsburgh. After the first World War he joined the Alling & Cory interests where he rose from a salesman to the office of vice president and manager. His broad civic interests led to his appointment as chairman of the code committee of the NRA in 1934, and his popularity in the trade led to his election as president of the trade association in 1947.

He is survived by his widow, a son, and a daughter.

▼

▶▶▶ *Chester Beecher,* former superintendent of the Nicolet Paper Corporation, De Pere, Wisconsin, passed away in Orlando, Florida, July 18 at the age of 61. He is survived by his widow, two sons and two daughters.

▼

▶▶▶ *Edward J. Johnstone,* associated with the Lockport Felt Company for the past 18 years as a sales engineer, passed away at his home July 11, in Lockport, New York. Mr. Johnstone was a member of the Technical Association of the Pulp and Paper Industry, and before joining Lockport Felt, was associated with the Superior Chemical Company, Holyoke, Massachusetts. He is survived by his widow and a son.

▼

▶▶▶ *John M. Stoeger,* night superintendent of the Telulah Mill of the Fox River Paper Corporation for many years, passed away June 28 in Appleton, Wisconsin. He was 59 years old. He is survived by his widow, four sons, and a daughter.

▼

EDWARD J. BURNELL

Vice president and general sales manager, and director, of Link-Belt Company, Chicago, Edward J. Burnell, passed away at his home in Winnetka, Illinois, July 22.

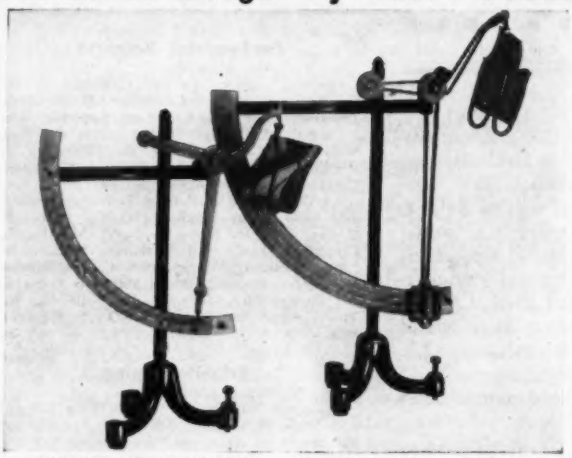
Mr. Burnell was born in Tondu, Wales, April 7, 1888, and came to this country with his family and lived in Catasauqua, Pennsylvania. He graduated from Lehigh University in 1910.

Edward J. Burnell

Mr. Burnell served Link-Belt Company in many important capacities, in engineering, sales, and plant management. During the war he served on the advisory boards of Machinery Branch of War Production Board and the Chemical Corps of the War Department, and as consultant to the Reconstruction Finance Corporation.

He is survived by his widow and two children.

PAPER • TISSUE • BOXBOARD SCALES for Basis Weight by Sheet Count



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Cady Tissue Scale (left) registers 0 to 20 lbs., shows weight in lbs. for 480 or 500 sheets. Doubling weight furnished for registering 20 to 40 lbs. Note adjusting device on leg for balancing.

Cady Paper Scale (right) registers ¼ to 120 lbs., shows weight in lbs. for 480 or 500 sheets; in Kilograms for 500 sheets only. Also made to show weight in lbs. for 1000 sheets.

Cady Boxboard Scale (not illustrated) registers number of sheets per 50 lb. bundle; has clip for sample instead of basket as above, and special base for balancing large sheets. All Cady scales are precisely calibrated, easily balanced. Blade type verniers assure error free reading.

Write for complete information and prices of Cady Instruments for establishing and comparing weights, structures, thicknesses: Scales, Burst Testers, Dial Micrometers. Stock or special models available.

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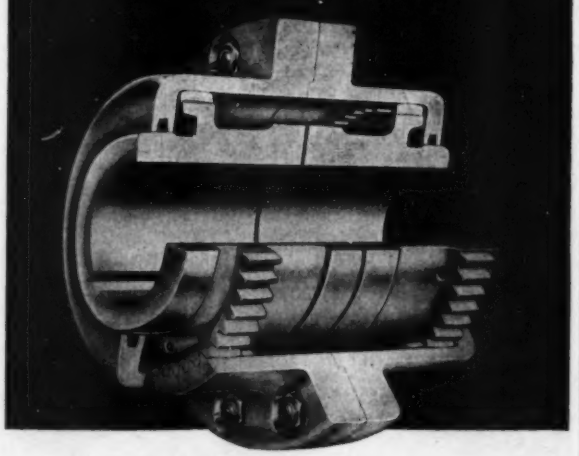
POOLE



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Butterworth Calender Rolls are made of long staple cotton free of foreign materials and first quality paper of high rag content. Before delivery, Rolls are carefully tested for hardness, smoothness and density. A special process locks the roll to the shaft so it can't slip or come loose.

Whether you do plain calendering, heavy duty friction work, glassine, embossing or chasing work, Butterworth Calender Rolls will give you many additional hours of top flight service. Call us on your calendering problems. We make Calender Rolls in every size for all types of calendering, or we can refill your present rolls.

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Butterworth Calender Rolls

Associations.....

BIG ATTENDANCE FORECAST FOR 4th PACKAGING AND MATERIALS HANDLING EXPOS.

Over 80 leading manufacturers of packaging and materials handling equipment and components have announced that they will exhibit at the Fourth Annual Industrial Packaging and Materials Handling Exposition on October 4, 5, and 6 in Detroit, Michigan. C. J. Carney, managing director of SIPMHE, anticipates a total attendance at the Exposition and sessions of over 7,000 people, based upon present indications.

The Exposition, last year, was attended by packaging and materials handling specialists and other company executives from forty states and from several foreign countries, including a strong representation from Canada.

The 1949 Exposition includes active co-operation by Wayne University in Detroit. This constitutes the "Institute" activity of the Exposition, and will include sixteen specialized discussion sessions, lecture sessions, and panels, scheduled from October 3 through October 7. Oustanding speakers have been secured from various industrial fields, retail management, and from the business press.

The Society of Industrial Packaging and Materials Handling Engineers, sponsor of the Exposition, has shown a marked growth during its four years of existence, now totaling nationally approximately 1,200 individuals representing over 800 companies.

The Detroit session will be held at Convention Hall. Complete information and registration blanks are obtainable from SIPMHE national headquarters at 20 West Jackson Blvd., Chicago 4, Illinois. Those who plan to attend are urged to inquire as soon as possible about hotel accommodations, with which the national headquarters' staff is prepared to assist.

▼

FALL MEETING OF TAPPI

The first program released for the fall meeting of the Technical Association of the Pulp and Paper Industry, which will convene in Portland, Oregon, September 14-15, reveals a list of interesting and valuable papers. An over-all preview of the subjects to be presented at the sessions is given herewith:

General Session—First Day

Presentation of the Shibley award by National President A. E. Bachmann—Winner: Vance Reynolds, Puget Sound Pulp and Timber Co., Bellingham, Wash, "The Separation of Dirt from Unbleached Pulp by Centrifugal Type Classifiers" (cf. P.I. and P.W., May, 1949, p. 222).

"The Status of the Pacific Coast Pulp and Paper Industry," Lawson Turcotte, vice president, Puget Sound Pulp and Timber Co., Bellingham, Wash.

"Japanese Pulps and Pulping," H. R. Murdock, Roberts & Co. Associates, Atlanta, Georgia (formerly Chief of Pulp and Paper Branch, Natural Resources Section, G.H.Q., Tokyo, Japan).

Engineering

G. H. Pringle, presiding

"Corrosion and Corrosion Testing in the Pulp and Paper Industry," R. A. Huseby and M. A. Sheil, A. O. Smith Corporation, Milwaukee, Wis.

"Hydraulic Barking, A Summary," L. E. Hill, Pulp Division, Weyerhaeuser Timber Company, Everett, Wash.

"Paper Mill Design and Construction," J. H. McCarthy, St. Regis Paper Company, Tacoma, Wash.

Fundamental Research

J. L. McCarthy, presiding

Opening remarks by the Chairman of the Fundamental Research Committee, H. F. Lewis, The Institute of Paper Chemistry, Appleton, Wis.

"Report on Lignin Studies under the Pulp Mills Research Project at the University of Washington," D. M. Ritter and J. L. McCarthy, University of Washington, Seattle.

"A Commercial Method of Isolating Conidendrin from Waste Sulphite Liquor," Homer B. Lackey, W. W. Moyer and W. M. Hearon, Central Research and Technical Department, Crown Zellerbach Corporation, Camas, Wash.

"Surface Area of Fibrous Materials Using an Air Permeability Method," J. C. Brown, Jr., The Institute of Paper Chemistry, Appleton, Wis.

Sulphite Pulping

G. H. McGregor, presiding

"Digester Linings for Soluble Base Sulphite Pulps," E. F. Tucker, Stebbins Engineering and Manufacturing Company, Watertown, N.Y.

"Progress Report on Magnesia Base Pulping," S. E. Hazelquist, Pulp Division, Weyerhaeuser Timber Company, Longview, Wash.

"Certain Factors that Influence Delignification in Acid Sulphite Pulping," G. A. Richtee, Wood Cellulose Development Department, Eastman Kodak Company, Kodak Park, N.Y.

Papermaking

A. E. Bachmann, presiding

"Beater Additives in Papermaking," D. T. Jackson, Hammermill Paper Company, Erie, Pa.

"Effect of Phenolic Resins on Physical Properties of Kraft Paper"—P. K. Baird, R. J. Seidl, and D. J. Fahey, U. S. Forest Products Laboratory, Madison, Wis.

"Consumers' Ideas on Paper Quality," F. H. Abbott III, Sunset-McKee Co., San Francisco, Calif.

Alkaline Pulping

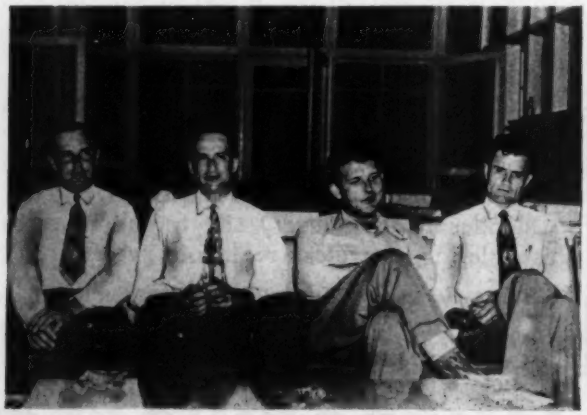
H. C. Wall, presiding

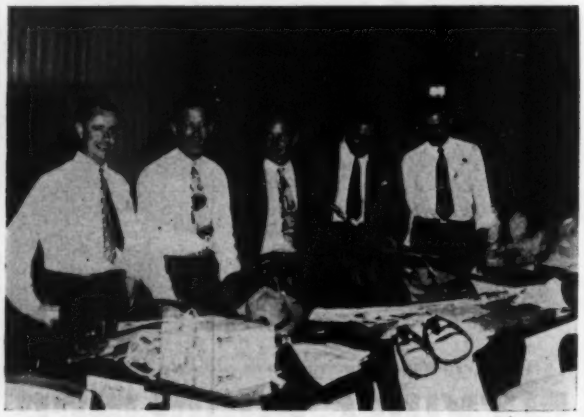
"The Pulping Properties of Decayed Douglas Fir," J. N. McGovern, United States Forest Products Laboratory, Madison, Wis.

"Centrifugal Clarification of Kraft White Liquor," A. E. Reed and W. F. Gillespie.

"The Relation of Kraft Pulp Quality to Wood Properties of Dauglas Fir," R. N. Hammond and P. S. Billington, Research Department, Pulp Division, Weyerhaeuser Timber Company, Longview, Wash.

(Continued on page 588)





NEW OFFICERS OF Kalamazoo Valley Section of TAPPI are shown above at left. L to R—Fred L. Schuker (Hercules Powder Co.), treasurer; Dr. Victor S. Burstein (Michigan Paper Co., Plainwell), secretary; Dr. James Harrison (Michigan Carton Co., Battle Creek), vice chairman; and Dr. Stephen I. Kukolich (Lee Paper Co.), chairman. Elected at the annual picnic and fun day in the early summer, the new officers will take over at the first meeting in September. MEMBERS OF TROPHY COMMITTEE and prizes given at Fun Day Program are seen at right. L to R—John B. Verdon (American Cyanamid Co.), chairman; Kenzie Phillips (American Cyanamid), Donald Knight (Bulkley, Dunton Co.), Frederick C. Van Streain (Price and Pierce), and Dr. S. I. Kukolich (Lee Paper Co., Vicksburg)

TAPPI Goes West Again

FOR THE THIRD TIME in history and the first time since 1940, the fall meeting of TAPPI will be held on the Pacific Coast, in Portland, Oregon—the center of some of the most interesting new developments in the pulp and paper industry. The meeting dates are September 12-15, with headquarters at the Multnomah Hotel where the Technical Association held a most enjoyable meeting in 1934. A special air-conditioned train, with modern equipment throughout, will travel over the Union Pacific System and will leave Chicago at 3:00 p.m. September 8.

Two stop-overs will be made: the first at Sun Valley, Idaho, on Saturday morning; the second on Sunday at Bonneville Dam on the scenic Columbia River just above Portland. A trip to the woods is on the schedule for the opening day. Howard Morgan, manager of the Pulp Division of Weyerhaeuser Timber Company, will conduct the group over the company's Tree Farm and logging operations. The following day there will be visits by motor to mills nearby, and the ladies will take a trip to Mount Hood, with a special luncheon and a ride in the ski lift. Every moment of the trip will be most enjoyable—something those who have the privilege long will remember.

← Albert E. Bachmann
National President
of TAPPI

→ W. F. Holzer
Program Chairman
Fall Meeting of
TAPPI and Chairman
Pacific Section

← R. J. LeRoux
and
A. G. Natwick →
Co-chairmen of
TAPPI Fall Meeting

Portland, Oregon, has made preparations to welcome Tappimen and families when they arrive for the TAPPI fall meeting

Flanked by mountainous majesty, the mighty Columbia River will be seen for the first time by some of the TAPPI visitors

Mount Hood as seen from Lookout Point on Larch Mountain. Wives who accompany Tappimen will go to the Mount and ride on Ski Lift

Sun Valley, Idaho, where the TAPPI special train will stopover for a full day of sight-seeing

Comparative Pulpwood Studies

H. F. Lewis, presiding

"Sources of West Coast Pulpwoods," J. M. McEwen, Research Department, Pulp Division, Weyerhaeuser Timber Company, Longview.

"The Chemical Constituents of the Woods," H. F. Lewis, The Institute of Paper Chemistry.

"The Pulping of the Woods," K. G. Booth and W. F. Holzer, Central Research and Technical Department, Crown Zellerbach Corporation, Camas, Wash.

"Specific Morphological, Chemical, and Physical Properties of the Kraft Pulp Fibers," H. F. Lewis, The Institute of Paper Chemistry.

"Comments on the Springwood and Summerwood Fibers of Dauglas Fir," W. F. Holzer and H. F. Lewis, Central Research and Technical Department, Crown Zellerbach Corporation, Camas, Wash., and The Institute of Paper Chemistry, respectively.

General Session—Last Day

K. P. Geohegan, presiding

"The Economic and Social Status of the Pulp and Paper Industry," E. W. Tinker, American Paper and Pulp Association.

"The Position of Cellulose as a Chemical Raw Material," L. S. Sinness, Director of Research, Rayon Division, E. I. duPont de Nemours & Co., Inc., Wilmington, Del.

"Trends of Research in the Cellulose and Pulp Field," Emil Heuser, La Jolla, Calif.

"The Problems of Education in the Pulp and Paper Field"—John G. Strange, The Institute of Paper Chemistry.

THREE OF THE FOUR officers elected to serve the Michigan Div., American Pulp and Paper Mill Superintendents Association are: L to R—Wm. F. Hathaway, asst. mgr. paper manufacturing, KVP, chairman; Richard Pieters, St. Regis Paper Co., secretary-treasurer; O. W. Callighan, Edgar Brothers, 1st vice chairman. (Wm. Shaw, Michigan Carton Co., 2nd vice chairman, was not present for photo.)

COMING EVENTS

Sept. 8-10—N. Y.-Canadian Div. Superintendents Association, Champlain Hotel, Bluff Point, Plattsburg, N.Y.

Sept. 9-10—Southern Paper Trade Association, Buena Vista Hotel, Biloxi, Miss.

Sept. 12-15—TAPPI (National) General Fall Meeting, Multnomah Hotel, Portland, Ore.

Sept. 16—Conference of Northeastern Wood Utilization Council on Wallboards will be held in Cambridge, Mass., with the co-operation of Harvard University. Attendance limited to 75. Obtain invitations by writing E. L. Heermance, Sec., Northeastern Wood Utilization Council, New Haven 6 Conn.

Sept. 22-24—Northeastern Div. Superintendents Association, Fall Meeting, Poland Spring, Maine.

Sept. 26-29—National Paper Trade Ass'n, Fall Meeting, Stevens Hotel, Chicago.

Sept. 30-Oct. 1—New Jersey-Delaware-Pennsylvania Div. Superintendents Association, Fall Meeting, St. Patrick's Inn, Mt. Pocono, Pa.

Oct. 1—Connecticut Valley Div. Superintendents Association, Red Lion Inn, Stockbridge, Mass.

Oct. 4-7—Society of Industrial Packaging and Materials Handling Engineers, Fourth Annual Exposition, Convention Hall, Detroit, Mich.

Oct. 10-14—West Coast Meeting, American Society for Testing Materials, Fairmont Hotel, San Francisco, Calif. (First national meeting of ASTM on West Coast.)

Oct. 14-15—Southeastern Div. Superintendents Association, Hotel Roanoke, Roanoke, Virginia.

Oct. 24-26—Supt. Ass'n, Southern Div., Fall Meeting, Frances Hotel, Monroe, La.

Oct. 25-28—National Safety Council, 1949 National Safety Congress, Chicago.

Oct. 31-Nov. 3—TAPPI, Engineers Conference, Statler Hotel, Boston, Mass.

Nov. 1-5—Pacific Chemical Exposition, California Section, American Chemical Society, Civic Auditorium, San Francisco, California.

1950

Jan. 16-19—First Plant Maintenance Show, Auditorium, Cleveland, O.

STATED MEETINGS

Chicago section of TAPPI meets the third Monday of each month at the Chicago Bar Association, Chicago, Ill. First meeting of the season will be held Sept. 19.

Semtile tanks have no limitations as to shape or size, provided a vertical type unit is used.

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Semtile salt-glazed tile presents a smooth flowing, easy to clean surface.

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TO DETERMINE MOISTURE PERCENTAGE

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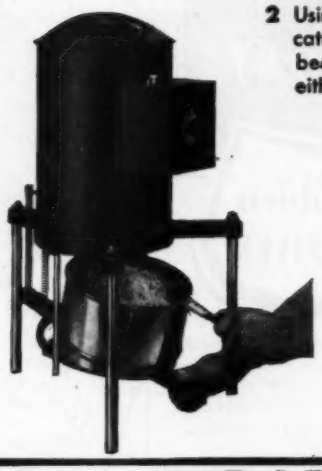
in the plant for moisture control in material processing or for laboratory moisture determinations.

Accurate
1 Calibration is not required since moisture is determined gravimetrically.
2 Same accuracy is obtained as in oven drying.

Fast
1 Moisture in the sample is quickly converted to vapor which is carried out through the filter cloth bottom of the sample pan by an adequate stream of hot air.
2 Drying time is only 2 minutes for some materials and up to 15 minutes for materials difficult to dry.



Simple
1 No calibration or calculations.
2 Using the new computing beam balance and a catch weight, the operator merely balances the beam before and after drying and reads directly either the percentage of solids or moisture.

Flexible
1 Moisture Teller drys one sample at a time or may be used for the rapid drying of several samples simultaneously.
2 Moisture Tellers are available in several models which accommodate sample pans having diameters of 2¾", 5¼" and 8" with depths of 1", 2", 4" and 12", for samples of from 1 to 500 grams.
3 The samples may be fibrous or granular solids, liquids or slurries. Raw materials, paper in process and finished stock tested with no change in setup.

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- Alpha* Protein adhesive has a color which does not affect, to any extent, the colors of the pigments used or their hiding power.
- Alpha* Protein alkaline-cut adhesive permits addition of formaldehyde to coating colors to make the finished paper water resistant.
- Alpha* Protein adhesive is free-flowing at a low water ratio.
- Alpha* Protein adhesive keeps pigments or other insolubles more uniformly suspended—prevents formation of hard, difficult-to-disperse masses.
- Alpha* Protein adhesive sets quite rapidly and dries easily without undue shrinkage or interference with the finish when the paper is calendered.

PROSEIN* A mechanically refined soya protein adhesive, Prosein* is preferred for reasons of economy in cases where certain outstanding qualities exclusive to Alpha* Protein are not required. Compatible with Alpha* Protein and other alkaline-cut protein adhesives in all proportions. An efficient adhesive for many uses.

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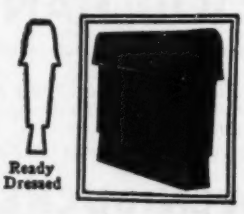

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Current Comment . . .

The opinions expressed here are from a commentator close to the industry, who, in the past, has interpreted briefly the trends of the paper industry. His comments, which hereafter will appear at greater length than before, and in broader scope, are based entirely on economic and financial facts that emanate regularly from sources that speak with authority.

FOURTH QUARTER UPTURN AFTER VACATION SLUMP

With mass vacations in the paper mills during July, production figures for the month are the lowest of the year, and it is probable that the third quarter will show the lowest profit margin for 1949. The fourth quarter, however, appears likely to more than overbalance the weaker showing of the balance of the year and produce a reasonable profit for the year as a whole. That this profit position may continue for some time is probable, but the manufacturers realize that the windfall profits of 1947 and 1948 may never be equaled. Some mills welcome the opportunity, already too long delayed, to curtail output and conduct maintenance and repair operations.

The net result is a further reduction of inventories both at the mills and in the hands of customers to a point where it seems certain that the worst effects of the business recession are behind us. Fourth-quarter buying to build up depleted inventories can be anticipated and no further price reductions on any broad scale can be anticipated. There is no longer a tendency on the part of the mills to make price concessions to secure tonnage.

A banking agency has analyzed (unofficially) the present position of the paper industry in comparison with the depressed period of the early thirties. In this analysis it is felt that the paper mills, as a whole, are in a stronger financial position than ever before, and the weak financial spots are fewer in number and less crucial. The growing tendency, with this element of financial strength, is to refuse to sell at any figure which does not produce a decent profit. No longer is it considered good business to take a loss today in order to have a dollar in the bank tomorrow; for the past prosperity has accumulated sufficient dollars to make sacrifice sales unnecessary.

THE FOREIGN PICTURE

A decision by the Scandinavian nations to reduce the prices of all papers, except newsprint, by 10 per cent has forecast a rush of foreign sales, particularly to the United States.

Whether this will result is not yet clear, but Sweden is finding it more advantageous to sell to continental Europe than to enter the United States market. Sweden's production costs are higher than those of Norway or Finland. Finland, however, is making a further determined effort to increase its exports by devaluating its currency approximately 17½ per cent. The new value, as of July 1, is 160 marks to the dollar instead of the former 136 marks. This is equivalent in itself to a price reduction of approximately this figure.

Extended discussions in the United Kingdom and Sweden looking toward a possible devaluation of the pound sterling and the kroner, respectively, have apparently resulted in a decision to hold to the present values, in terms of the dollar.

WASHINGTON

A drive by the Administration forces in the direction of antitrust attacks on big business as such have had repercussions in the labor side of the picture. In hearings before a House of Representatives committee, the C.I.O. backed the Administration view that big concentrations of industry (in such industries as steel) are in themselves conducive to price controls and that there should be a limitation on the size of corporations. In a Senate committee, however, industry took the position, strongly supported by influential senators that such unions as the miners, steel workers, and automobile workers are a form of monopoly dangerous to the nation's economy.

Proposals to include labor unions, formerly exempted, from the operations of the antitrust laws are being seriously studied. This view is that if a big corporation is of itself a monopoly, the same rules should apply to labor monopolies. The action by John L. Lewis ordering miners to work only three days a week has focused attention on the power of a labor monopoly to control production, and, therefore, prices.

▼

FINANCIAL

▶▶▶ THE GREATLY improved industrial situation was marked by an almost universal increase in the quotations for paper mill securities during the past month. Paper mill issues followed the general trend of the nation's securities exchanges.

American Box Board Company—Net income for six months ended May 31 was $303,845 as against $980,663 for the same period a year ago.

Brown Company—Net income for twenty-eight weeks ended June 11 was $1,092,000 as against $2,303,000 for the same period a year ago.

Champion Paper & Fibre Company—Net income for eleven months ended March 31 was $9,997,283 as compared with $8,540,-040 for twelve months ended April 30.

Container Corporation—Net income for six months ended June 30 was $3,609,840 as compared with $4,215,911 a year ago.

Crown Zellerbach Corporation—Net income for the fiscal year ended April 30 was $21,179,080 as compared with $19,614,698 for the previous year.

Minnesota & Ontario Paper Company—Net earnings for six months ended June 30 were $1,735,525 as against $3,060,375 a year ago.

St. Regis Paper Company—Net income for six months ended July 2 was $3,202,888 as compared with $8,744,935 a year ago.

Soundview Pulp Company—Net income for six months ended June 30 was $2,709,-621 as compared with $2,028,184 a year ago.

Sutherland Paper Company—Net income for six months ended June 30 was $855,847 as compared with $1,101,698 a year ago.

Union Bag & Paper Company—Net income for six months ended June 30 was $3,258,016 as compared with $7,272,367 a year ago.

New York Stock Exchange—Stocks

	Closing Prices July 25	June 24
A.P.W. Products	*2⅞-3	*2⅜-2¾
Celotex	16¼	15½
Same Preferred	*15⅝-16¼	15⅝
Certain-teed Products	11⅛	10
Champion P & F Co.	22⅞	19
Same Preferred	92½	91½
Chesapeake Corp.	18¼	*18⅛-18⅜
Container Corp.	35	31
Same Preferred	96	96
Continental Diamond	*6⅜-7¼	6¼
Crown Zellerbach	24⅝	22
Same Preferred	98⅝	96
Same $4 Preferred	*93-95½	*89½-91
Dixie Vortex	26⅜	*24¼-25¼
Same "A"	47½	46½
Eastern Corp.	8½	8½
Robert Gair	5⅜	5
Same Preferred	16	15
Gaylord Container	18¼	16⅜
International Paper	49¼	44½
Same Preferred	98½	95
Kimberly-Clark	19⅜	18
Same Preferred	*91-93½	91½
McAndrews & Forbes	33	32½
Marathon	*29-30¼	17⅞
Masonite	45⅞	41
Mead Corp.	12½	14
Same Preferred	76¼	73
Same 2nd Preferred	*32½-34	28⅝
National Container	5⅝	5½
Paraffine Cos.	17⅝	15⅝
Same Preferred	*102¼-103¼	102½
Rayonier Inc.	*24⅞-25⅛	23⅝
Same Preferred	*29⅞-30	28½
Scott Paper	*55½-55⅝	53⅜
Same Preferred $3.40	*94-94½	93
Same Preferred $4	103⅝	
St. Regis	6⅝	6⅜
Same Preferred	*78-79	80¼
Sutherland Paper	*32-32⅜	32
Union Bag & Paper	22¼	21⅜
United Bd & Carton	5	4⅝
United Wall Paper	3⅜	4
Same Preferred	*22⅜-24	*22⅜-24¼
U.S. Gypsum	*98⅜-99⅜	92
Same Preferred	*176¼-178	170
West Va P & P Co.	40	37
Same Preferred	*106-107½	105

New York Stock Exchange—Bonds

A.P.W. Products 3⅝	70	74⅝
Celotex 3½%	100½	101½
Champion P & F Co 3½	*101¼-102	101⅝
Mead Corp 3⅝	102	102

New York Curb Exchange—Stocks

Am Writing	*5⅜-5⅝	5⅜
Great Northern	36⅜	32⅝

*Closing Bid and Asked Prices

Paper Mill Corporate Changes

Combined Locks Paper Company—An issue of 25,000 additional shares of 4½ per cent preferred stock has been privately placed.

McLaurin-Jones Company—The purchase of the Grand Rapids, Michigan, business of the Grand River Paper Corporation by McLaurin-Jones has been announced. The Grand Rapids company was originally known as the Tanglefoot company, manufacturers of fly papers and later of other gummed products. The old Tanglefoot plant will be operated as the Grand Rapids Division of the McLaurin-Jones Company and the Tanglefoot lines will be produced in future both at Grand Rapids and Brookfield, Massachusetts.

National Container Corporation—The Century Corrugated Carton, Miami, Florida, has been acquired by the National Container Corporation, and will be operated as the Miami division of the National company.

Perfect Safety Paper Company—This corporation, established at Holyoke in 1895 is being merged with George LaMonte & Son of Nutley, New Jersey. As considerable stock in the two companies is held by identical interests, it is expected that savings will result by consolidating the manufacturing operations of the two companies at the LaMonte, Nutley, New Jersey, location.

Safety

NAT'L CONTAINER HAS MILLION MAN-HOUR SAFETY RECORD AT JACKSONVILLE

The Jacksonville, Florida, Safety Council on July 20 reported that employees of the Kraft Pulp and Board Division of National Container Corporation in Jacksonville had reached a record of working 1,000,000 man hours without a "lost time" or disabling accident. W. T. Webster, vice president and general manager of the corporation, told the council that the record had been established several days previous and that the campaign had extended from last September 4, resulting in it having been established in 315½ days. The company holds safety meetings regularly to discuss the progress of the safety program and interest developed in proportion to the man hours achieved without an injury. One of the employees, according to Mr. Webster, devised a hand signal, similar to the victory signal used during the war, to warn co-workers if they were about to commit a hazardous act or if they saw any other unsafe condition. This was adopted by the entire plant and in this manner everyone became conscious of the hand signal as a safety warning.

▼

KVP WINS PLAQUE FROM LOCAL SAFETY COUNCIL

A highlight of the recent annual dinner of the Kalamazoo (Mich.) Safety Council was the presentation of a bronze plaque to Ralph A. Hayward, president of the Kalamazoo Vegetable Parchment Company.

This award was given in recognition of the company's low lost-time accident rate for the past year. Among firms in the city, with 750,000 or more man-hours, KVP rated a frequency of 13.9. First place in the industrial division of the Council was taken by the Upjohn Company—the Sutherland Paper Company was a close third with a frequency rate of 14.2.

▼

NATIONAL SAFETY COUNCIL PUTS SECTIONAL CONTESTS ON A CALENDAR YEAR BASIS

The Industrial Conference of the National Safety Council has arranged to operate sectional safety contests on a calendar year basis, running from January 1 to December 31.

Plants that have participated in the 1948-1949 Paper Industry Contest are automatically enrolled in the new 1949 contest. In order to effect the change from the present basis (July 1 to June 30) to the calendar year basis, the following procedure will be instituted.

1. The present contest which started July 1, 1948, *will end as of* June 30, 1949. Awards will be given to the winners in this contest as provided in the 1948-1949 Contest Rules.

2. Another contest will run to the end of this year, December 31, 1949.

3. This new contest will cover the *entire year 1949.*

4. The last six months of the 1948-1949 contest (January-June, 1949) also will be the first six months of the new contest.

5. The July report will be the *seventh month* report in the new 1949 contest. On this report be sure to show *new cumulative* totals from January 1, 1949.

W. C. James, director of the Statistical Division, National Safety Council, 20 North Wacker Drive, Chicago 6, will answer any questions that arise in making this change-over.

▼

NEW SAFETY RECORD SET AT WESTVACO MILL; EMPLOYEE BANQUET GIVEN AS REWARD

Fun and food are good friends of safety, officials of the Williamsburg plant of West Virginia Pulp and Paper Company have learned as a result of an offer made to employees more than six months ago.

Last February the mill gave two dinners for members of departments which had completed twelve months work without a lost-time accident, plus 38 individuals who had worked 30 years or more without a lost-time accident. These dinners were such a success that Melvin L. McCreary, then manager of the Williamsburg plant, decided to see if he couldn't inspire a big one for everybody in the mill. If all departments would complete the next

SAFETY PLAQUE presentation being made by E. L. Ludvigsen, vice president and manager of Fuller Mfg. Co., and president of Kalamazoo Safety Council. Left to right: Donald Stillman (Allen Electric and Equipment Co.); A. E. Kriegsmann (Consumers Power Co.); James Lewis, Council director; Mr. Ludvigsen; Claude Snyder (Peter Eckrich and Sons, Inc.); Ralph A. Hayward (Kalamazoo Vegetable Parchment Co.), receiving plaque for his company; R. A. Wesson, (Clarage Fan Co.); Harry E. Turbeville (Upjohn Co.); Roy Andrus (Kalamazoo Gazette); and John C. Wood (KVP). Mr. Wood is chairman of the industrial division of the Kalamazoo Safety Council

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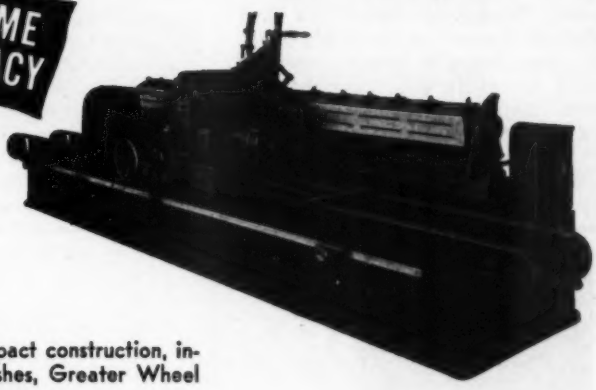

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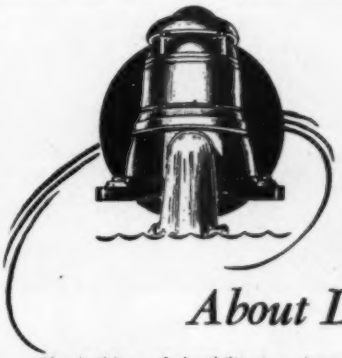

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six months without a single lost-time accident, he said, the company would stage a full fledged banquet, with professional entertainment and all the trimmings, for the whole crowd.

Word of Manager McCreary's offer spread around the mill. Supervisors began stressing safety with a new enthusiasm. Employees, who often had shunned them as uncomfortable or unnecessary, began to wear as a regular habit the safety shoes, goggles, and other safety gear required on their jobs. Safety regulations were adhered to strictly, nobody took unnecessary chances, and "safety" soon became a by-word throughout the plant.

On May 1, two months before the end of the contest period, manager McCreary left Williamsburg to assume a new post in the company's sales department in New York. When he turned over the reins to J. Lynne Ferner, who came from the safety-conscious Tyrone mill to assume the managership, he told his successor of the promise.

All departments sailed through the final two months of the contest without a mishap. When the last shift left the mill on June 30, the plant had established a new safety record at Williamsburg—more than 575,000 man-hours worked without a single lost-time accident spoiling its record.

The employees—total payroll of 488—reaped the reward for their safety achievement. In contrast to the small crowd last February, the celebration this time had to be staged in shifts. The auditorium of the Williamsburg High School was filled with safety "eaters" on the nights of August 1, 2, 3, and 4, with about 130 present each night, and a turkey dinner, plus a floor show of four acts, was staged for each group.

Plant officials watched details of the big four-shift banquet with great interest, because there's a possibility of a repeat performance. The safety-conscious Williamsburg employees didn't stop observing good safety practices after they had won their prize on June 30. There still hasn't been a lost-time accident in the plant since December 7, 1948. They are out to break the company record of 287 days, now held by Tyrone.

▼

WORONOCO NO. 1 AWARDED STRATHMORE SAFETY OUTING

The 111 employees of Strathmore Paper Company's No. 1 Mill at Woronoco, Mass., together with members of their families, went to Savin Rock in chartered busses the last of June for an all-day outing and shore dinner.

This outing was a reward from Strathmore to the employees of Woronoco No. 1 Mill for having won the inter-mill safety contest in competition with Strathmore's No. 2 Mill at Woronoco and its mill at West Springfield.

Since 1920, Strathmore has held a safety contest each year, starting May 1 and ending April 30, in which all three of the Strathmore mills compete.

The Woronoco No. 1 Mill has established a particularly outstanding record in the inter-mill safety competition. The employees of this mill worked from January, 1937, until October, 1947, without a lost-time accident, and they did not have any lost-time accidents during the period from May 1, 1948, through April 30, 1949—the period of the competition for which they won the outing this year.

▼

▶▶▶ LED BY THE Glens Falls plant of Marinette Paper Company (a subsidiary of Scott), which established a perfect record of no lost-time injuries during 1948, Scott Paper Company, Chester, Pennsylvania, safety performance reached a new all time peak last year with the lowest number of lost-time accidents since the Scott Inter-plant Safety Contest was started six years ago. This record proves the support which has been given to the Scott safety slogan: *Think, Work, Talk Safety.*

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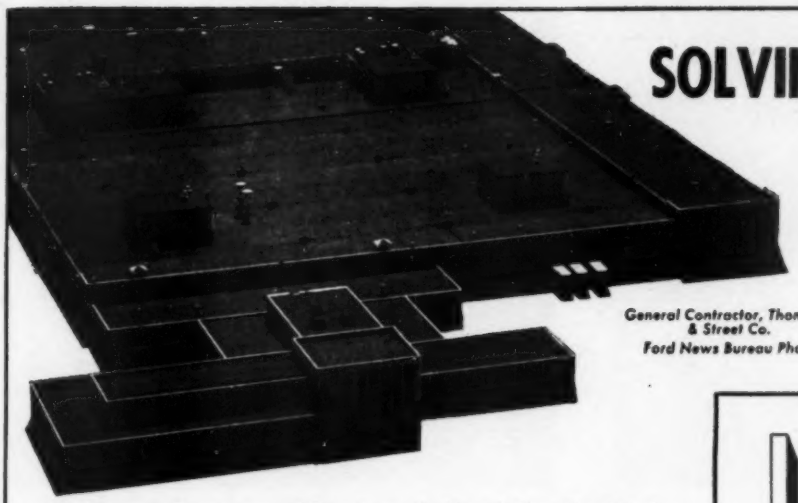

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Ford News Bureau Photo

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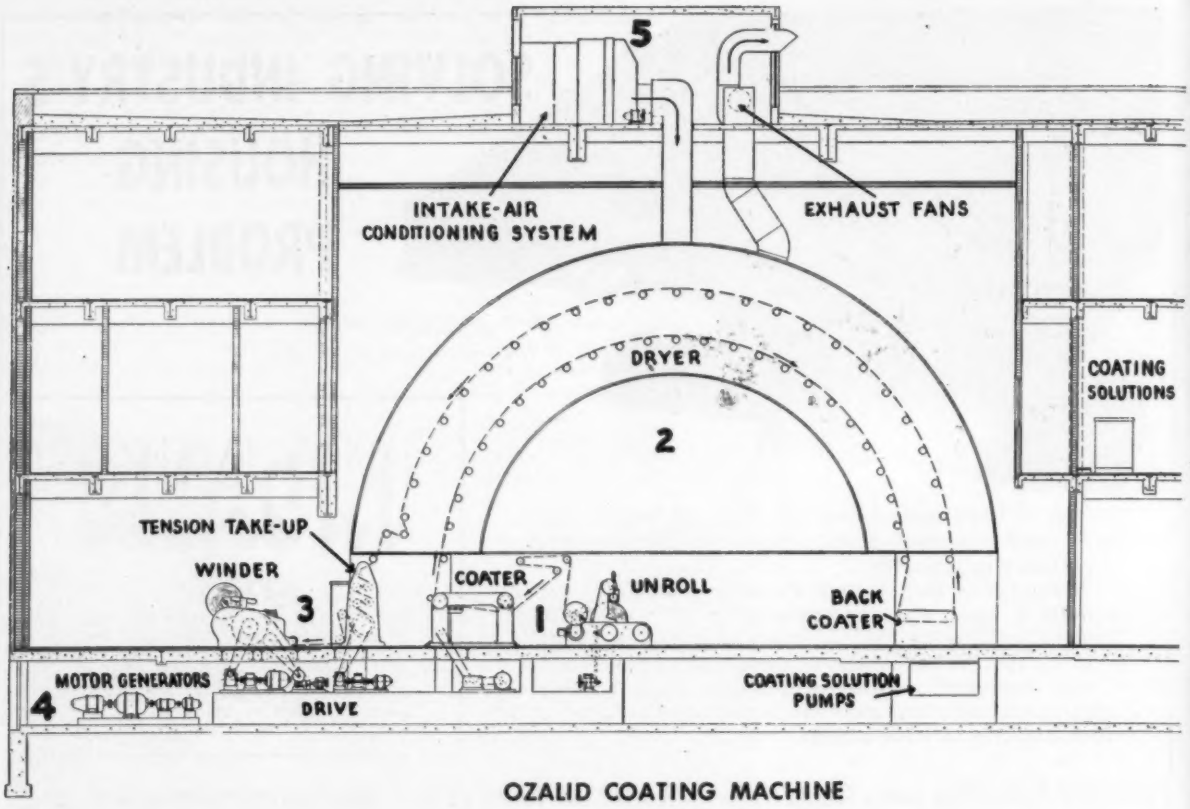


OZALID COATING MACHINE

High Speed Coating of Reproduction Papers

E. K. MURPHY
Engineering & Service
Westinghouse Electric Corporation

H. G. DAVIS
Ozalid Division
General Aniline & Film Corporation

▶▶▶ DIRECT PROCESS reproduction papers have gained increasing acceptance during the past two decades. These papers, represented by Ozalid dry developing materials, not only have replaced the older blueprint process in the reproduction of engineering drawings, but also have found diversified use in the business field for rapid and accurate reproduction of forms.

This steadily growing demand for direct process reproduction papers influenced the Ozalid Division of General Aniline & Film Corporation to develop and install a single, large, high-speed coating machine to replace the seven old type coating machines in the company's main plant in Johnson City, New York.

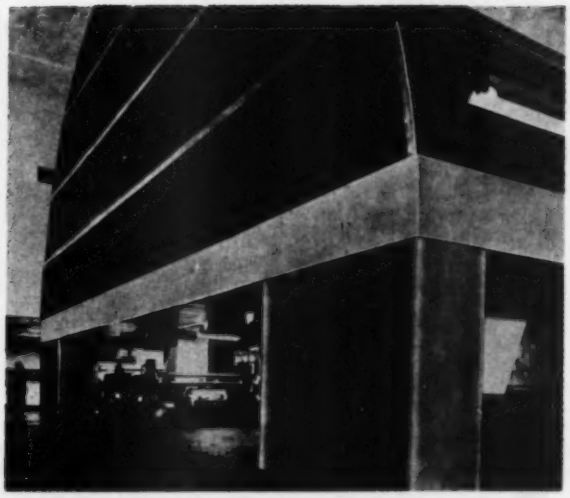
In the past, expansion was accomplished by addition to the number of conventional slow-speed, narrow, coating machines. Further expansion along these lines, while relatively inexpensive in terms of capital outlay, seemed to be costly from the point of view of operating efficiency. The company's decision to build the new coating machine inaugurated an extensive research program in which literally every commercially used coating method was tried.

Specifications

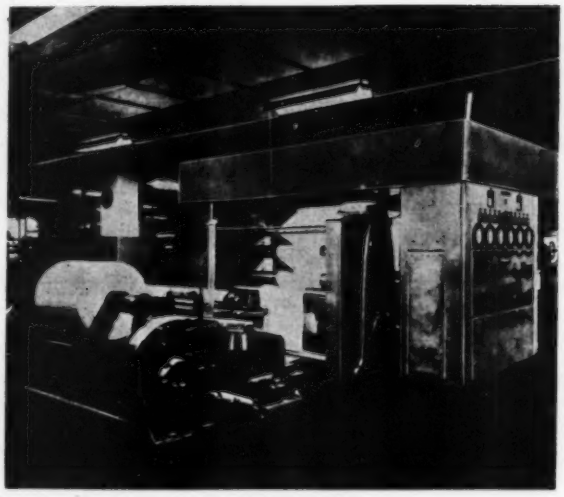
In this development, the most stringent requirement was that the coating be applied in a layer of even thickness, with a permissible variation of only a few millimicrons, across the full width of an 80-inch sheet, irrespective of variations in the thickness of the paper base. A further requirement was that this degree of precision be maintained at speeds up to 1000 fpm. This particular problem finally was solved by using a John Waldron Corporation Microjet coater as the basic unit for applying coatings on paper raw stock. However, some important design changes were made in this coater to adapt it to Ozalid's own requirements.

In the course of the research work on this machine, the problem of drying the coated paper at high speeds, without deteriorating either the light-sensitive chemicals (which have some tendencies toward heat sensitivity) or the paper base, became a major headache. An important factor was that the Ozalid coating process is, strictly speaking, not a coating process at all but an impregnation process in that the sensitizing solution is applied to the paper and allowed to penetrate into the surface of the paper to an exact, predetermined depth, at which point penetration is arrested, and the paper dried. The problem was complicated further by the lack of space in which the dryer could be erected. These problems finally were

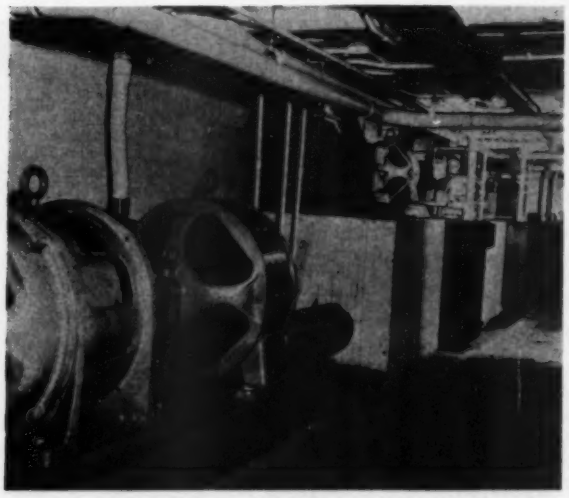
1 Unroll unit and Microjet coater—operates up to 1000 fpm



2 Dryer and back coater (right); sheet makes two passes through dryer



3 Tension take-up unit and winder; control panel (right)



4 M-G set (left) and drive motors are located in basement

solved by co-operation of the J. O. Ross Engineering Corporation with Ozalid.

The machine itself is a huge three-story high affair of which the dryer is the largest unit. This dryer is mounted eight feet above the operating floor on four large corner columns and inside of these columns are located the stairways that lead to the interior of the outer housing of the drying channel. This outer housing is constructed of sheet aluminum panels insulated with a two inch thick layer of rock wool. Within this outer housing are two superimposed air dryers providing semicircular passages for the paper including their associated drives, ducts, heaters, blowers, fans, etc. Two sets of arched stairways are provided on both sides of the inner housing. On the inside of each pass of the inner dryer are slide plates and climbing rungs for access to various parts of the equipment.

Coating Operations

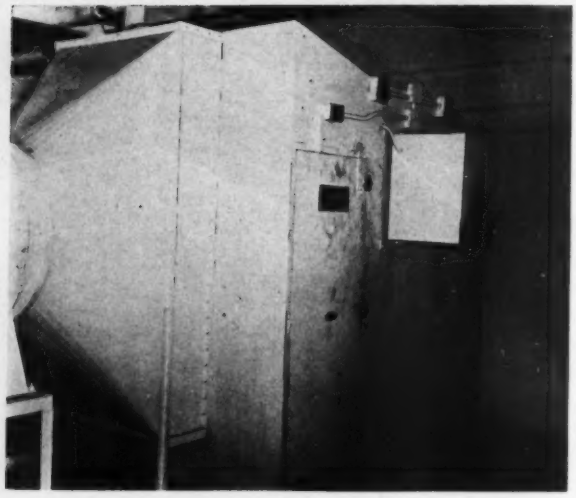
Coating starts with an automatic unroll unit capable of taking rolls of paper up to 38 inches in diameter and equipped with a Waldron constant web tension device. A feature of this unroll unit is an arrangement that permits flying splices from one roll to another to be made at any speed up to 1,000 fpm without slowing down either the unroll or the rest of coating machine. The second unit is the Microjet coater which embodies a new air jet doctor.

In operation, an excess of coating is applied to the web by means of applicator rolls. This excess is then blown off the sheet and the residual coating that is left on the sheet is smoothed out and leveled off into a perfectly uniform film by passing the sheet through a flat, elongated jet of high pressure, high velocity air, which impinges against the sheet at an oblique angle.

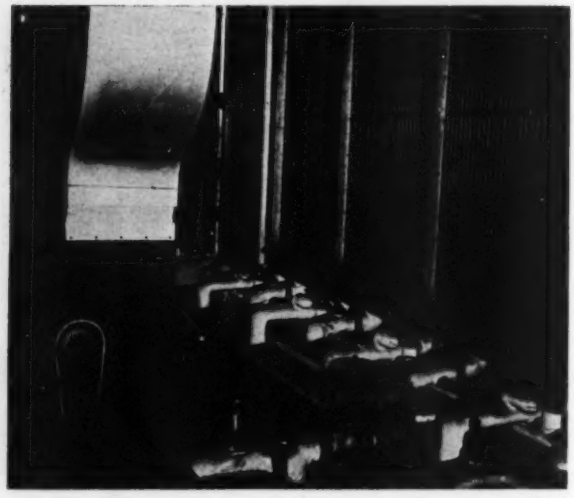
The wet coated paper then enters the double arch Ross dryer which utilizes heat exchangers instead of the open gas flames employed by the old machines. The air in the dryer is passed through the heaters, then through a blower and is finally conducted to large, perforated plenum chambers placed directly above the sheet and from which the air is blown directly against the wet coated surface of the web. The same air, minus a small portion which is exhausted to the atmosphere, is conducted back to the heater and is thereby continuously recirculated. The forced circulation of air with the air blowing directly against the wet web results in quicker drying and permits greater operating speeds.

Drying

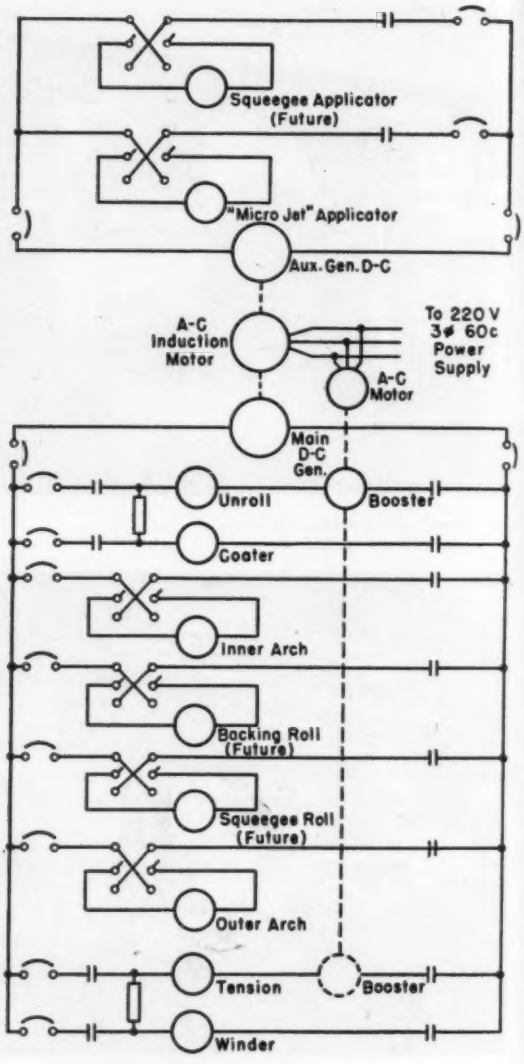
Each of the two passages through the dryer is divided into three zones. The dryer therefore contains six independ-



5a Air for drying passes through Precipitron electrostatic air cleaner



5b Clean air passes over steam coils before going to dryer



D-c power circuits (schematic diagram) for new Ozalid coating machine

ent zones, each of which is provided with a complete drying system consisting of air heaters, blower, a perforated plenum chamber described previously which directs the air against the paper, air ducts, control dampers, etc.

Air withdrawn from the dryer is replaced by two exhaust fans, one for each pass, located in a penthouse on the roof of the building directly above the machine. In this penthouse also is located a complete air-conditioning system which includes a Westinghouse Precipitron electrostatic air cleaner which supplies pure air to the outer housing of the dryer to insure complete cleanliness and ideal atmospheric conditions at all times, as well as to add fresh air as needed for each of the six supply units.

After drying, the paper reaches the web tension control unit containing a large drum used for cooling the coated and dried paper down to room temperature or lower before it is wound up. This roll of drum serves the dual function of exerting an additional pull on the web to keep it under tension as well as cooling the paper.

The drum type winder is capable of winding rolls up to 38 inches in diameter, and is equipped for changing from a full roll to an empty core by means of an air lance. It has a hydraulic roll lowering device used for removing completed rolls from the winder and lowering them either to the floor or onto trucks. A special feature of this Waldron winder is the hold-down arms for controlling the new core being started until such time as the weight of the bundle exercises control.

Built-in Flexibility

One of the basic requirements of this machine was a designed flexibility far beyond standard practice. The Diazo reproduction process is continuously expanding into new fields. The Ozalid coating machine must be capable of modifications to keep pace with new products and manufacturing methods. Consequently, the machine was designed as a number of individual components, each complete in itself; it was possible to remove and replace each one with a corresponding unit without disturbing the other components.

This flexibility requirement, plus the desirability of having a speed ratio of 50:1 to take care of the wide range of materials and coating conditions encountered made the selection of a suitable drive extremely difficult. After consultation with engineers of the Westinghouse Electric Corporation, an a-c, d-c drive having a speed ratio of 7:1 was decided upon. This basic ratio was stepped up to approximately 50:1

by the inclusion of two-speed gear reducers at every drive motor, by means of which these motors can be geared to their associate equipment at either a 1:1 or a 7:1 ratio by merely throwing a shift lever on each gear box. The main drive for the machine is of the adjustable-voltage type, with individual motors for each section of the machine.

Electrical System

All power for the section drives is furnished from a four-unit motor-generator set which consists of two adjustable voltage d-c generators, a d-c exciter and a squirrel-cage, induction driving motor. The large d-c generator powers all desired section motors except the Microjet color roll and the pan rolls. These latter two drives obtain their power from the independently adjustable small d-c generator, since the speed requirements of these color applicators do not bear a linear relation to those of the sections actually carrying the web.

The basic operating speed range of the main drive, as governed by adjustable voltage control of the large d-c generator, is from 14 to 100 per cent of rated speed. There is further adjustment of most individual sections by field control; this is available for trimming or draw control. The operating speed range of the two sections powered from the small d-c generator is from 10 to 100 per cent of rated speed, with further adjustment of the color roll by field control. In addition to this operating or product speed range, a threading speed of 10 per cent is available for all sections.

Although the drive is inherently nonreversible, switching arrangements were provided in the control to permit reversal of direction of most motors. This facilitates changes in process and direction of web travel and is therefore provided on a set-up basis only.

To assist the unroll in its function of maintaining a pre-set tension between the mill roll and the coater, a booster generator is connected in the armature circuit of the unroll drive motor. The tension exerted by the unroll is obtained by permitting the coater drive to overhaul the unroll through the web, thereby causing the unroll drive to act as a drag generator, putting power back into the d-c system. For the case when a new mill roll is being threaded into an empty machine, the unroll drive must act as a motor until the web is well through the coater and then the desired tension may be applied. The same conditions apply when a fresh roll is started up on auto-paster operation.

The coater drive is the lead motor of the system, all speeds and tensions being controlled in terms of the speed of this section. This arrangement prevents inadvertently raising speeds of the overall drive through draw adjustment and thereby working the draw controls out of their range. Overall machine speed changes are accomplished by changing the generator voltage, in this manner preserving draw adjustments and keeping the vernier controls well within their range.

Individual manual draw controls are furnished on both the inner and outer arch dryer drives. The pre-selected dryer draws are maintained by a dancer roll riding the sheet as it leaves the outer arch dryer. This dancer in turn operates a rheostat to regulate simultaneously the speeds of the tension unit and the winder to maintain dryer draws.

Tension between the tension unit and the winder is maintained automatically in a manner similar to that used between the unroll and the coater. Here again, a booster generator is used, this time in conjunction with the tension drive, to permit that unit to act either as a motor or a generator, as required, to maintain the tension chosen by the operator.

For proposed future alternate methods of coating, such as squeegee, knife or bead, other sections of the machine may be used. These future sections are switched in or out of the circuit when setting up for a given method of production. Some sections will serve dual purposes, as in the case of the backing roll, which will serve as a return roll when coating is being applied only at the coater.

Flexibility of the machine and its drive required extra precautions to insure against incorrect operation. The layout of the main control board itself does much to guard against this. Here the operator finds not only the necessary push-buttons and similar devices necessary to operate the drive, but also meters, gages and indicating lights to tell him the operating status of the machine. Ammeters tell him of the load imposed on each motor, warning lights indicate any overload conditions, and alarms sound if he does nothing to correct such conditions within a reasonable time. Also, there are temperature indicators and recorders for each of the oven drying zones, as well as draft gages for indication of air flow in and out of the dryer system.

Drive Control System

Actual drive controls include push-button stations for setting up the desired sections, a master Thread-Run-Stop set of buttons for the two adjustable voltage systems, and controls for pre-setting the desired running speeds of these two independent systems. This arrangement permits the operator to set up for the desired operation even before threading up the machine, following which the machine can be run at threading speed while the web is being run through. Once this initial threading has been completed, the operator need only momentarily depress the run button to cause the drive to accelerate automatically to the pre-selected running speed. There are no restrictions on when the value of the running speed may be changed; it may be done at any time.

The drive may be brought to rest by either of two methods. For a controlled stop, the Thread button may be depressed, causing the drive to be automatically decelerated to the threading speed, preserving all draw adjustments and tensions. When the machine has completed deceleration to this low speed, depressing the stop button deenergizes the section motors and the machine coasts to rest. The other method is for an emergency stop when preservation of the web is a minor consideration. For this condition, the stop button is pressed immediately, without going through the process of a controlled slow deceleration to threading speed. The Thread-Run-Stop set of pushbuttons is duplicated in two other locations besides the control panel, and in addition, six emergency stop buttons are located at various points on the machine in order to facilitate emergency stops in case of web breaks.

Auxiliary Controls

In addition to these controls for the machine proper, the main board also includes the means of controlling the motors for the many auxiliaries such as supply, exhaust, and circulating fans for the dryer system, circulating pumps for the coating solution, the hydraulic system for mill roll handling, the Microjet air supply compressor, the dryer Precipitron electrostatic air cleaner.

The great number of functions included on the main board created a real layout problem. Ozalid became sufficiently concerned over the possibilities of operator confusion in this myriad of buttons, lights, gages and meters that they built a full scale mock-up of the board and carefully checked the proposed location of all devices. A number of changes were directed and manufacture was allowed to proceed. Subsequent operating experience has indicated that these extra efforts paid dividends, since the arrangement has not only followed logical patterns but also made it possible to read or control the necessary devices easily without undue effort or confusion.

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Fundamentals of Slime Control

B. F. SHEMA
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Not many years ago the papermaker regarded the presence of slime as a necessary evil. Usually, effective control was a matter of chance. Often, the only preventive was to throw an occasional shovel of bleaching powder into the white-water system.

But times have changed: Slime-forming organisms have been identified; technologists have learned how to minimize contamination of stock and white-water systems; the importance of the subject has challenged a number of chemical companies to ease this papermakers' problem by developing slime control agents.

In an effort to bring out the facts of slime control, THE PAPER INDUSTRY and PAPER WORLD will publish several papers on this subject during the next few months. This first article outlines fundamental aspects of slime occurrence and control. The author has investigated slime control in dozens of paper mills throughout the country. His observations should provide an excellent introduction to the subject.

▶▶▶ ADEQUATE SLIME control is essential in the normal operation of a paper mill. It has been demonstrated conclusively that slime materially reduces the efficiency of the various machines that are used in the manufacture of either pulp or paper. The presence of slime makes it virtually impossible to obtain or maintain those conditions which are optimum for the manufacture of high-grade pulp or paper.

Mills that produce the lower grades of paper can (and oftentimes are compelled to) tolerate a certain amount of slime, principally because of the nature or the source of the raw stock. This acceptable tolerance of slime will vary among mills, and may vary between machines within a given mill. Therefore, each mill must establish its own program of slime control based upon a fundamental knowledge of the cost of slime. This cost will vary according to the type of paper produced, the types and number of machines in the plant and their relation to each other, the type of mill system, etc. The mill operator should analyze critically those tangible defects which can be attributed directly to slime.

Slime Costs Money

In an evaluation of this type, it is important that the operator consider the following factors:

1) Lost production time
   a. number of wet end breaks
   b. number of dry end breaks
   c. frequency of cleanups required
2) Reduction in quality of paper
3) The extent and time involved in weekly cleanups
4) Increased cost of final product
5) Increased maintenance cost

After a critical evaluation of these and possibly other factors, it will be found that some degree of slime control is essential in most mills. However, there are those exceptions where slime is nonexistent or else it exists in such small amounts that practical slime control is not feasible.

Many of the slime problems will be more or less automatically solved or the intensity of slime formation reduced by the discontinuance or the curtailment of production of certain paper products. During the war years and, to some extent, in the postwar period, pulp and paper mills operated on a seven-day work week. In the past year, many mills have resumed their normal operations of a six-day work week and, consequently, are now able to devote more time to good weekly cleanups.

Everyone agrees that good housekeeping is the best practical method of slime control. If this practice of good housekeeping is coupled with an intelligent application of a good slimicide, excellent slime control will be the result.

It is an established fact that most slime deposits are caused by microorganisms. Many workers have isolated and identified the various species of bacteria and fungi that are commonly present in this heterogeneous mass of microorganisms. These studies are very important contributions because they show that the nature of slime varies, especially in the number and type of organisms present. They indicate further that some slimes may be composed almost entirely of one species of bacteria, whereas others may be conglomerate masses of fungi and bacteria. The number and the relationship of the various species of bacteria and fungi affect the physical characteristics of the resulting slime.

Types of Slime

In general, tough leathery slimes are of bacterial origin. Frequently, this type of slime is composed of a single species of a spore-forming bacterium. The rather firm gelatinous slimes are composed principally of nonspore-forming bacteria. Here, again, this type of slime may be composed of only one species of bacteria, such as the capsule-producing species *Aerobacter aerogenes*. The character of this slime may vary from large jelly-like masses to relatively small round granules.

The tapioca-like slimes are often colored and are commonly called pink slimes. The pink color may be attributed to a dye that is used in the papermaking process, to a colored bacterium, and/or a combination of both. The small granular pink colored slime is oftentimes caused by a species of *Micrococcus*.

Semisolid slimes, which incidentally are the most prevalent, are composed of both fungi and bacteria. In general, the greater the number of bacteria, the tougher will be the resultant slime.

Loose stringy slimes are composed primarily of fungi. These slimes are rarely observed in the paper mill system proper, although they are frequently found at the fresh water intakes, especially if the water is rich in the type of food that can be assimilated readily by the fungus.

Microbiological Activity

Although it is known that slime is caused by microorganisms there is a lack of specific information concerning the association of these microorganisms and the effect that they exert upon each other while in this association. Further, it is known that, in nature, microorganisms normally grow and reproduce while in close proximity. These microbiological associations (depending upon the effect that they produce) may be classified into four major groups:

(1) the synergistic, (2) the mutualistic symbiotic, (3) the antagonistic symbiotic, and (4) commensalistic.

Synergism is the joint action of two or more organisms on a substrate, resulting in an effect which neither of the organisms is capable of producing separately.

Mutualistic symbiosis is the association in which two or more organisms live together without exhibiting a detrimental effect upon each other.

Antagonistic symbiosis exists when one or more organisms produce a substance that prevents or inhibits the growth of another organism. This toxic material may have a specific effect upon certain groups or types of microorganisms.

Commensalism is the association of one or more species, one of which is benefited by the association, whereas the others are neither benefited nor injured.

These associations occur commonly in nature, and it is reasonable to expect that they play an important role in the development and selection of microorganisms in a pulp or paper mill system. At the present time, little is known about their ultimate effect on the formation of slime. Oftentimes, however, it has been observed that when the microflora of such a system is slightly altered, a pronounced change in the formation and the character of slime results. In some cases, this change has resulted in a reduction of slime.

Preliminary experimental evidence indicates that these microbiological changes are brought about either by one or both of the following conditions: (1) a natural selection of organisms, (2) an upset in the normal microbiological balance. This selection or microbiological upset can be induced by the addition of a toxicant, by increasing the supply of specific foods which in turn stimulates the growth of antagonistic organisms, by changes in the furnish, and by physical changes in the mill system.

Where Slime Occurs

Amount of slime formed or tolerated in any given mill system is determined or influenced by one or more of the following factors: the type of pulp, the source of fresh water, the amount of recirculated water, the various components of the paper furnish, and the type of mill system.

In general, there is less slime formed in a chemical pulp mill than in a groundwood mill. This is to be expected because, in the process of making mechanical pulp, the sugars which are normally present in the wood remain in the pulp slurry, whereas, in the chemical pulps, they are removed either by the cooking liquor or by the wash waters. These sugars, of course, afford a more complete medium for the growth of microorganisms.

Futhermore, chemical pulp, because of the method by which it is produced, is sterile as it leaves the digester. Mechanical pulp as it leaves the stone contains viable bacteria which may be species of spore-forming bacteria, heat-resistant bacteria, and/or fungi. The filamentous fungi are found only if the grinding temperatures are low.

All things being equal, there is generally less slime formed in a kraft mill than in a sulphite mill.

Bleaching Kills Slime

Where there is a bleaching operation the method of pulping becomes relatively unimportant because the majority of the bacteria and fungi are killed by the bleaching agent. The toxicity of the two most commonly used bleaching agents, chlorine and hydrogen peroxide, is very well known. After bleaching, the pulp usually becomes contaminated with bacteria that are present in the wash water.

Wash water may be recirculated water and/or fresh water. Depending upon the process or the construction of the mill, the first wash may not contribute very many viable bacteria or fungi, whereas the subsequent washes usually add more and more of the undesirable organisms. Even though the wash water has a low bacterial count, the population of the organisms in the pulp is increased by the filtering action of the fibrous mat.

Water Should Be Treated

If untreated fresh water is used in these various washes, serious contamination can and oftentimes does occur. There are those exceptions, however, in which a mill may use a well water or a mountain stream of low bacterial count, so that water treatment is not always required. An uncontaminated stream having a low bacterial count may build up a high bacterial population in a short distance of flow.

For example, data obtained from one river show the effect of industrial and municipal wastes upon the growth of bacteria. This particular river, at its source, had a bacterial count of 500-1000 colonies per milliliter. Approximately ten miles down stream the bacterial count ranged from 400,000 to 600,000 colonies per milliliter. This increase in bacterial count can be attributed to the effluent of several different industries and to the wastes of two municipalities.

In general, regardless of the source, it is advisable to treat raw water to reduce the bacterial population, to prevent the formation of slime, and to inhibit the growth of iron bacteria. The problem of adequate water treatment generally becomes more complex as the raw water increases in solids and bacterial content. Without adequate treatment, it is possible for this water to inoculate the pulp with a sufficient number of bacteria and fungi to initiate slime formation anywhere in the mill.

Isolate White Water Systems

Since it has become common practice to recirculate water and to conserve fiber, slime has become a serious problem in many of the paper mills, and, to a lesser extent, in the pulp mill. In some mills white water is confined—that is, the white water from the pulp mill is not used in the paper mill or vice versa. Usually, if the white water from the paper machine is used in a chemical pulp mill, there is an increase in the growth of slime in the pulp mill.

Slime formation in the pulp mill is dependent principally on the nature of the white water. If the white water is high in dissolved solids, clays, starches, and/or various adhesives, the effect is greater than if it contains only fiber. At the present time many of the mills are in the process of changing the white water systems so that they function independently. This has the tendency to reduce slime or to restrict it to one portion of the mill or to one machine in the mill. As a result, slime, if it does form, is easier to control.

Slime is not a serious problem in most tissue mills, principally because of the nature of the furnish. In most cases, a bleached or a partially bleached chemical pulp is used. This pulp often has a very low bacterial count. The development of slime in this case generally depends upon a combination of several factors: the amount of recirculated water, the source of fresh water, the type of mill, and the components of the furnish. If fresh water is untreated and rich in available food, slime will result. In most cases, the furnish for tissue contains very little, if any, material other than fiber. However, when various adhesives and/or groundwood fiber are used in the furnish, slime will generally develop.

In the course of the past few years, the writer has had the opportunity of visiting several tissue mills, during which it was observed that the only slime control measure necessary was proper chlorination of the fresh water, together with a good weekly cleanup. In general, when adhesives are added to the furnish, slime becomes more prevalent. It has been established also that, as the amount of fines increases in the white water, slime is more prevalent.

Problems of slime control become increasingly complex by the addition of

various materials to the furnish (such as starches, clays), the type of pulp, and the percentage and kind of broke in the furnish. For example, book mills cannot operate efficiently without adequate slime control. In this type of mill the furnish generally fulfills the food requirements of most slime-producing fungi and bacteria, as it contains considerable amounts of clay, starch, and other suspended solids which act as protective colloids.

Mill Design Affects Slime Occurrence

The type of mill system influences the formation of slime. Many of the mills are relatively simple in design and this promotes a lower incidence of slime formation. However, most of the older mills (which are simple in design) have many protected places (dead ends) where bacteria and fungi may develop. These sheltered places serve as an excellent source of inoculum for the entire mill system. One of the most common places for the development of these microorganisms is in old pipe, one end of which has been generally capped and the other end left open to the mill system.

Mechanical design of a paper machine may contribute to the formation of slime. In general, less slime is formed on compact machines than on those machines whose system spreads throughout the mill. Whenever possible, each machine should be constructed so that it is a separate unit; consequently, there should be no overflow of white water from one machine to the next.

Machine speed is a very important factor in the effect of slime, especially when slime is responsible for wet and dry end breaks. Oftentimes small amounts of slime can be tolerated but this tolerance is reduced by the operating speed of the machine. In the past few years, it has been common practice to increase the speed of the machine beyond the speed for which the machine was orginally designed, which may result in the formation of strains and stresses on the wet web, foaming of the stock, and poor circulation of stock and white water, which may result in, or be aggravated by, slime formation.

Seasonal Variations

There are other general considerations which should be taken into account when slime is a problem or when slime conditions are anticipated. One of the more important of these is the climate and its influence upon the formation of slime in the mill. Most mills (especially those in the temperate regions) experience at least two periods during the year when slime becomes prevalent.

First of these peaks occurs in late spring and the other in late fall. In general, the incidence of slime is relatively low during the winter months and remains low as long as the river or the water temperatures remain low. There is a fairly rapid increase in slime formation as the temperature of the water increases. This increase continues until the latter part of May or the first part of June, at which time there may be a leveling off or a drop in slime formation because of the increase in the temperature of the river water. As the river water begins to cool, the incidence of slime again increases.

The optimum temperature for slime formation generally comes about the middle of September and remains through the first part of October. The incidence then dips and remains low for the winter. This sequence will undoubtedly vary among mills because of their geographical location and of the many other variables which influence the formation of slime. However, the general pattern is very characteristic for those mills which are dependent upon streams or rivers for their water supply.

Control of Slime

There are two general approaches to the solution of any slime problem: first, the *systematic* approach and, second, the *rule of thumb* approach.

The rule of thumb approach for adequate slime control is, at best, a gamble. The procedure generally followed is the addition of a toxicant to the mill system without considering the type of toxicant, the amount to be added, and/or the point of addition. This method does not necessarily consider the effectiveness of the toxicant upon the specific microorganisms which are responsible for the slime in the mill.

For example, it may be recommended to the mill operator that he use toxicant *A* for slime control and that it should be added at the beater at a definite rate per ton, either as a continuous dose, intermittently (such as: once every 4 or 6 hours, once every 24 hours), or as a continuous addition for a 2- or 3-hour period during any given 24-hour period. These dosage rates are purely arbitrary. Consequently, they are not based upon the resistance of the organisms that are present in this mill system to the toxicant, nor is the toxicant necessarily applied at that point in the mill system where it will be used to the best advantage.

Because of the nature of slime and the differences in mill design, it is impossible to plan a program of slime control without knowledge of the resistance of the microbiological complex, peculiar to the mill, to various toxicants; the point of entry of these microorganisms; and that portion of the mill system which serves as a focal point of infection.

The systematic approach, on the other hand, attempts to compensate for these variables which may be so important in effective slime control. Although in such an approach a definite procedure should be followed, certain allowances must be made for the variables that exist in the different mill systems.

Study the Problem

First consideration in the solution of a given slime problem is to study the particular mill or machine system. This can be accomplished by thoroughly studying the flowsheet of the mill system, which should show, at a minimum, the machine system and its counterparts. It should show the capacity of the system, the retention time of the stock in the chests, retention time of white water, the rate of circulation, etc.

The next step is a complete correlation of the flow diagram and the actual layout. This may be done by a thorough systematic tour, during which observation should be made of those points where slime may accumulate and/or where slime is prevalent. The observer should note superfluous piping, whether the system is independent of other systems, etc.

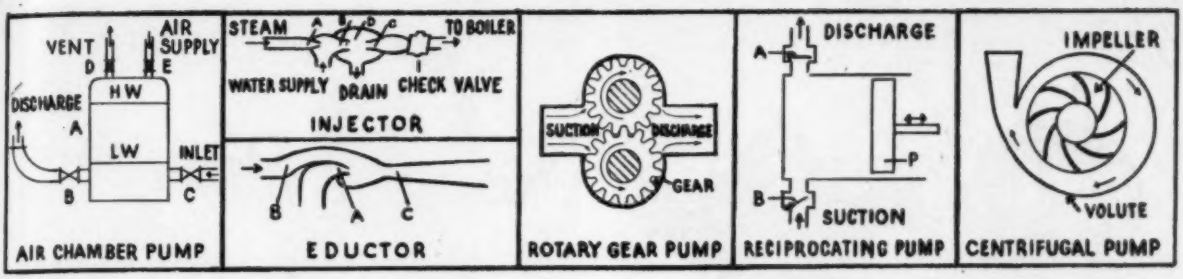
On the basis of the diagrammatic flowsheet and the visual examination of the mill, it is usually possible to select those points in the mill system from which samples should be collected for microbiological analysis. The number of sampling points will depend upon the severity of the slime and the complexity of the mill system. At any rate, a sufficient number of sample points should be selected so that the entire mill system is included in the survey.

Locate Points of Infection

If slime is prevalent in the headbox of a fourdrinier machine, the point of infection can be anywhere in the mill system; and the microbiological sampling should include the following places: furnish in the beater just before it is dumped, consistency regulating box, broke beater, stuff box, headbox, shower water, tray water, save-all, accepted stock, fresh water, white water storage tank, and any other point which may contribute to the bacterial content of the stock. The samples for analysis should be collected in a manner which is consistent with good microbiological sampling.

Immediately after collection, the samples are plated on standard bacteriological media and incubated in the usual manner. The daily microbiological analyses should continue for at least one week prior to initiating a treat-

(Turn to page 607)



AIR CHAMBER PUMP . . . Liquid flows into tank A by gravity through valve C with valve D open to allow escape of air until water level HW is reached. Valve D is then closed and valve E is opened to admit air under sufficiently high pressure to tank above the liquid. This forces the liquid out of the discharge check valve B against whatever discharge head exists. Valve E is closed when liquid in tank reaches level LW and valve D is opened again venting the tank so the cycle can be repeated.

INJECTOR . . . Steam supply going through nozzle A at high velocity picks up water from supply pipe and is condensed by the water in combining tube B. The resulting jet is driven through the delivery tube C and the check valve into the boiler. Space D provides for the escape of water if the adjustment causes the steam to pick up too much water.

EDUCTOR . . . A liquid under pressure discharges through nozzle A at a high velocity picking up liquid from supply B. The resulting jet enters the venturi tube C and its velocity energy is converted to pressure energy.

ROTARY PUMP . . . In the external-gear type of rotary pump, two intermeshing gears are mounted in a casing so the liquid in the spaces between the gear teeth and the casing is carried from the suction to discharge.

RECIPROCATING PUMP . . . A piston P is pushed back and forth in a closed cylinder C. On the outward stroke, liquid is drawn into the cylinder through suction valve B and on the inward stroke the liquid is forced out through discharge valve A into the discharge line.

CENTRIFUGAL PUMP . . . In a radial-flow centrifugal pump liquid enters the impeller (a rotating set of curved vanes) near the shaft and is thrown out radially by centrifugal force into a casing with a volute passage or with a set of diffusion vanes to convert the velocity energy into pressure energy.

Pumps and How They Work

Here is the first of a series of articles that will provide pulp and paper men with a better understanding of the practical fundamentals of centrifugal pumps, their construction, operation and maintenance. The authors are eminently qualified in this field. They have been associated with Worthington for many years and have specialized in the application of centrifugal pumps for numerous processes and industries.

Igor J. Karassik and Roy Carter
Application Engineers
Worthington Pump & Machinery Corporation

▶▶▶ NO MACHINE OR TOOL, barring the wedge, the lever, and the wheel, have a longer history in the service of man than the pump. Pumps, some very similar in principle to some present day forms, were used by man before the Greek and Roman periods. Possibly because of their centuries of use, pumps are taken for granted and their importance in our lives is not realized. Many of our present day machines have reached their degree of reliability and perfection because pumps are an integral part of them. Automobiles would still be in the model T stage with thermostatic circulation for cooling, splash lubrication of parts, an elevated gasoline tank for gravity feed and mechanical brakes were it not for pumps. As the principle of the piston and valves existed in pumps long before internal combustion engines were thought of, those engines are indebted to pumps for their basic mechanical principles.

The principles on which various types of pumps operate are (1) lifting by buckets, (2) drawing by creating a vacuum or (3) forcing by pressure or a combination. In the first group could be classed the sweep, the windlass, buckets on a revolving wheel, the chain and bucket pump and the Archimedian screw, all still in use. In the second group come the injectors, siphons or eductors and, combined with the first or third, most of the hand pumps like the pitcher pump. In the third group falls the force pump, the various rotary types, most of the reciprocating designs, the devices using compressed air and the centrifugal types.

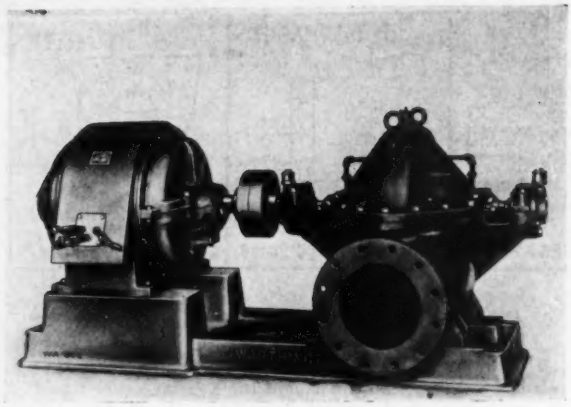
Commercially in what could be called pumping machinery we find a number of types of pumps being used. Without attempting to classify their operation by principle there are:

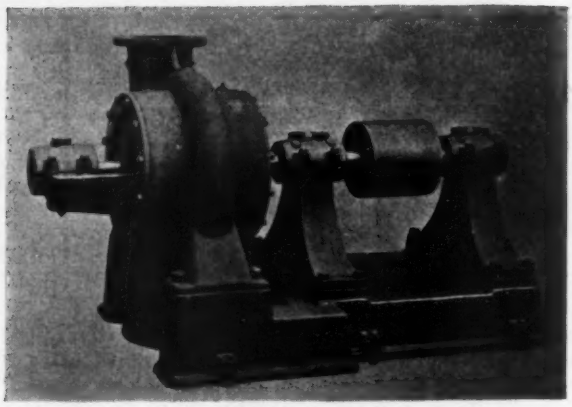
1) air chamber type
2) injectors
3) siphons and eductors
4) rotary pumps
5) reciprocating pumps
6) regenerative pumps
7) centrifugal pumps

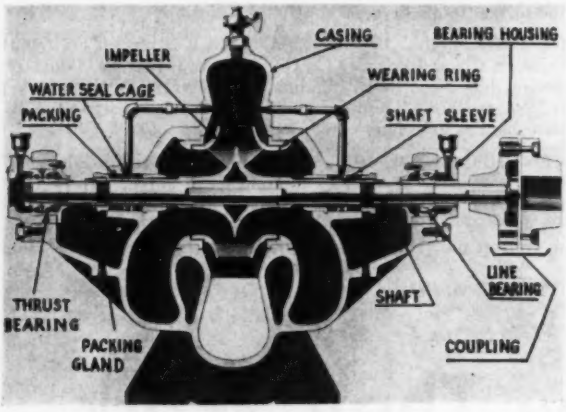
In the *air chamber* type the liquid flows by gravity into a closed tank which is vented to atmosphere during the filling period. When the tank is filled, the inlet valve and vent valve are closed and, after a valve in the discharge line is opened, air under presure is admitted to vessel forcing the liquid out of the tank and thru the discharge line. This pumping device with automatic controls is still a commercial product and is frequently used in the basement of buildings below sewer level for the collection and pumpage of sewage and other waste waters. A similar device called the Pulsameter employing steam as a motive power and a duplex tank arrangement was often used in mines.

Injectors have been commonly employed to add water to steam boilers particularly on locomotives. In an

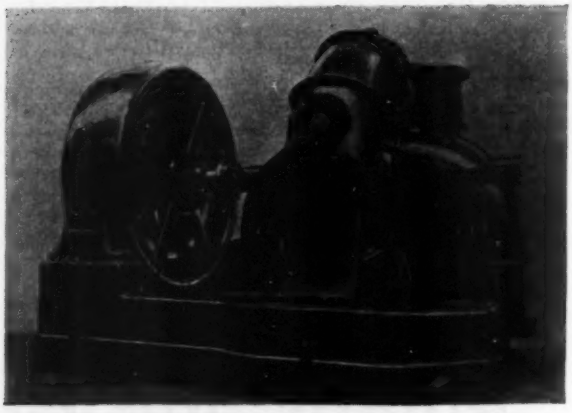
Material from this article will be included in a book on centrifugal pumps now being prepared by the authors; hence, all rights to republication are reserved by the authors.







Double-suction, single-stage centrifugal pump



Old style double-suction pumps

injector, steam from the boiler is expanded through a nozzle attaining a high velocity as it enters a chamber in which is the water to be pumped. As this jet picks up water, the steam is condensed and the resulting high velocity stream of water, which is partly the condensed steam, has enough energy to carry it into the boiler. Naturally, energy to inject the water comes from the condensation of the steam.

Siphon and eductor types of pumps, called ejectors by some, can be used with steam, a compressed gas or liquid as a source of energy. In a water jet eductor, the power water flows through a nozzle producing a high velocity jet directed into a throat piece carrying with it first any air around the jet and then the liquid to be pumped. The discharge nozzle of the throat piece is tapered so the resulting high velocity stream is slowed down and the velocity energy converted to pressure energy.

In the steam jet siphon the action is similar but the actuating means is steam expanded in a nozzle. Similar to the injector, the steam is condensed by the water being pumped. If this type of pumping device is used with compressed air or some other gas as a source of energy, the discharge is a liquid and gas mixture.

Head in feet against which a steam jet siphon can operate is roughly equal to the available steam pressure in pounds per square inch. In regular materials they are commercially available in sizes from ½ inch to 12 inches (suction and discharge) handing from 3 to 1600 gpm. When steam is available and when the resulting heating of the liquid or diluting by the condensed steam is either not objectionable or desirable, a steam jet siphon can often be used to advantage. In addition to being made of regular materials steam jet siphons have been made in the smaller sizes of glass and of stainless steel, and other materials for specific services.

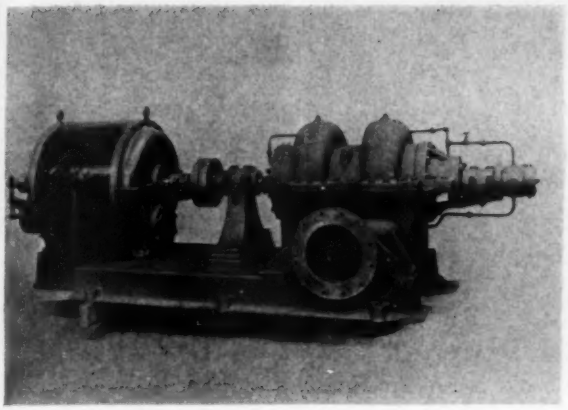
The head against which a water jet eductor will operate is roughly one-fifth the supply pressure. They are commercially available in regular materials in sizes up to 24 inches. In recent years, small capacity well pumping equipment using a centrifugal pump above ground discharging a part of its capacity down one pipe into a water jet eductor which forces a larger combined capacity up a second pipe into the suction of the centrifugal pump has become quite popular for farms and other domestic water systems.

Like other pumping machinery, steam jet siphons and water jet eductors are best for some applications, competitive with other types of pumping equipment in other applications and not competitive in still other applications.

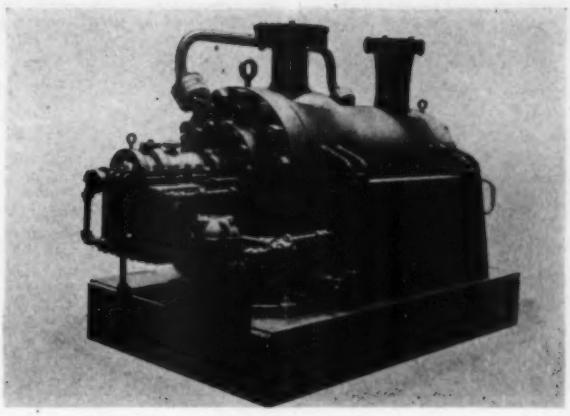
Rotary pumps, of which the gear pump is possibly the most common type, are used extensively for relatively small capacities and are especially applicable for many of the viscous liquids like some of the heavy oils.

The *reciprocating* type of pump is well known, particularly the duplex direct acting steam pump. Various types of liquid ends are used, piston, plunger, and diaphragm, some designs being single acting while others are double acting. Pumps may be made as single, duplex, triplex or more combinations of water end elements. The power source might be direct as in direct acting steam pump, through a crank and fly wheel or from some other form of prime mover either direct or through belting or gearing.

Regenerative pumps are often grouped with the centrifugal type. It is an interesting type and is useful and efficient for handling small capacities of low viscosity liquids. While it utilizes centrifugal force to generate pressure, the liquid is only acted upon by



Bi-rotor centrifugal pump



Modern high pressure multistage pump

the periphery of the rotating element and the path of the liquid is from one point on the periphery to another point almost 360 deg. away. In a centrifugal pump, on the other hand, the liquid enters the impeller near the shaft and is discharged at the periphery.

Centrifugals

Centrifugal pumps were originally employed as large volume low-head machines but have now become the most important pumping machine. Reduced to its basic function and fundamental parts, a centrifugal pump is a machine that consists of a set of rotating vanes, enclosed within a housing—or casing—and used to impart energy to a fluid through centrifugal force.

Thus, stripped of all refinements, a centrifugal pump has a rotating element, including an impeller and a shaft, and a stationary element made up of a casing, stuffing box and bearings. The structural details of these main elements as well as of all various refinements applied to the construction of modern pumps will be covered in future articles.

Among all the factors which contributed to the growing use of centrifugal pumps, one of the most important has been the development of electric power. This century has seen widespread adoption of electricity as the main source of power for most applications, replacing the small steam plants which were formerly so common. The various types of reciprocating pumps were ideal for steam drive but the development of the electric motor allowed the use of the lighter and cheaper, direct connected centrifugal pump.

While these earlier centrifugal pumps were inefficient compared to modern performance standards, their lower first cost more than compensated for this inefficiency. In addition, the centrifugal pump immediately demonstrated that it possessed quite a few other advantages over the reciprocating pump, advantages which led to a constantly growing application of the newer type of pumping equipment.

For example, the centrifugal pump gives a steady flow at uniform pressures with a complete absence of pressure surges. It develops a limited maximum discharge pressure under any operating conditions and provides the greatest possible flexibility of operation, as its delivery may be controlled either by variation of speed or through throttling.

Naturally, the manufacturers of centrifugal pumps have striven to enlarge further the field of application for this equipment and, through experience and research, have greatly improved the operating range of pressures, the efficiency and the mechanical and hydraulic design of their product. At the same time, the electric motor builders were improving their designs, permitting the pump manufacturers to use higher rotative speeds and develop pumps suitable for higher heads.

Types of Centrifugals

Modern centrifugal pumps can be divided into various types. The basic subdivision concerns the impeller itself, specifically with regards to the direction of flow in the impeller. Thus, centrifugal pumps may have (1) radial flow impellers, (2) axial flow impellers or (3) mixed flow impellers (a combination of the first two named). Insofar as these impellers are concerned, they may further be (1) enclosed (with shrouds or side walls enclosing the vanes), (2) open (with no shrouds), or (3) semi-open. Another subdivision of type concerns the question of water supply to the impellers. Thus impellers may be (1) double suction, with water flowing to the impeller symmetrically from both sides or (2) single suction, or impellers with a single inlet on one side. Subdivision of centrifugal pumps on the basis of the casing type yields two major groups: (1) volute casing pumps. (2) turbine or diffuser type pumps. In either case the pump casing may be split axially or radially.

Single or Multistage

A pump in which the total head is developed by a single impeller is termed a single stage pump. If the total head required is too high to be generated by a single impeller within practical limitations, two or more impellers (or pumps) may be used in series, the second impeller taking its suction from the discharge of the first impeller, etc. If all these impellers acting in series are located within a single casing, the centrifugal pump so constructed is termed a multistage pump.

In the early development of centrifugal pumps, bi-rotor pumps and even tri-rotor pumps were fairly common. These pumps were in effect two half-capacity or three third-capacity pumps built into one casing and operating in parallel.

Centrifugal pumps may be either horizontal or vertical in reference to the axis of rotation of the shaft. In some specific applications, the axis of rotation may even be inclined to the horizontal—as in the case of dewatering pumps in inclined mine shafts.

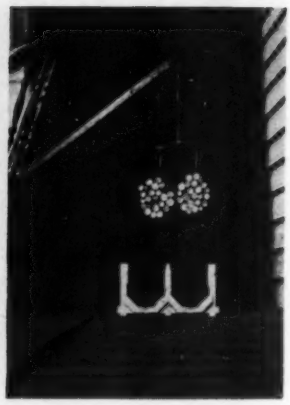
Horizontal shaft centrifugal pumps are also classified with respect to the location of the suction nozzle, and may be: end suction, side suction, bottom suction or top suction.

It may be of some interest to get a quick glance of the development of the centrifugal pump from the early models of the 1900's to the modern counterparts of the same models. Many of the changes in the mechanical construction took place for the convenience of service and maintenance. Other changes were simply the result of refinements of design, foundry or machine shop practice.

Pile wood in cradles

Bundles are tied

Hook on the grabs



Load away

Scale Models Aid Wood Handling Problems

C. E. "Dan" PATCH
Morton C. Tuttle Company

Model of original arrangement of drag conveyor and discharge chute; manual unloading required

New arrangement with more drop from drag to chute, one drag chain runs over sprocket near middle of chute; plowshare stops at end of conveyor; automatic unloading requires only manual supervision

▶▶▶ DID YOU EVER hear of a paper mill with a model wood yard? I am reminded of the woman who was always bragging to her friends about her "model husband." The husband of one of her friends got a bit peeved at continually hearing about him and finally exploded to his wife—"Do you know what a model is? Well, it's a small sized imitation of the real thing."

I am not suggesting that mills should lay their wood yards out in model to scale, but merely recounting a couple of instances where I have made crude models to get a better hunch as to how certain ideas might work out.

At one time, I was pondering a situation where 8-foot logs were being pushed off an incoming yard drag onto a feed conveyor for a gang saw. On either side of this gang saw conveyor was a man who spotted the logs properly lengthwise, and back of the yard drag was the man who pushed the logs off the drag. At times he had a helper.

There was a stop across the drag just beyond the saw conveyor, against which any logs not rolled off the drag would hit. At times, following logs would hit the end of the stopped log and cause a kick-up or start a jam. I wanted to try a new kind of a stop but knew I could hardly expect the mill to make and fit one in the short time I was to be there. So I looked about for some way to satisfy my curiosity with less expenditure of time and money. From the scrap piles, I obtained some wood and sheet metal. I had the carpenter shop cut out some circular discs. I borrowed some tinners' snips. At lunch time, I was able to get, at one of the local stores, some webbing with which to make my drags. I always have a mending kit with me so I was able to sew the webbing into two endless belts of the proper lengths and sew on some cleats.

After work, I went into the neighboring woods with my jackknife and cut some limbs that I could saw into 8-foot lengths of pulpwood at a scale of 1 inch equals 1 foot, that being the scale to which I built the model, shown in the accompanying snapshots. A crank was used to give motion to the drag belts.

One-half of the drag ran over a disc half way along the chute to the saw and the logs that rode on this side of the incoming conveyor usually rolled off as they cleared the side of the conveyor. Those riding the other side rolled off almost as soon as their ends hit the plowshare.

While it is never safe to assume that full sized equipment will duplicate the performance of a scale model, this one did at small expense, and in a short time indicated to me that the idea of a plowshare terminal was not entirely without merit. I later successfully made use of the same principle in another industry to save waste and to considerably increase the production of

a machine that was coupled with a conveyor.

At another mill, I saw the laborious work of getting pulpwood out of a ship's hold, and wondered why it could not come all the way from the woods in bundles instead of being handled in and out a stick at a time. When I got home, I bought some codfish hooks which were about the right size for a scaled down grab, built a piling rack such as would be used either in the woods or at the loading dock and cut some pulpwood to the scale of 1 inch equals 1 foot.

I rigged my crane on a kitchen chair and felt like the dad who bought a model railway for his youngsters at Christmas time. I figured that the full-sized wood would be secured in bundles with metal strapping, so I tied a piece of thread around each end of the pile. Then with my grab, which seized the bundle amidship, I swung the wood to the hatch of an imaginary ship. However, I could not get the bundle back under the deck in the hold of even an imaginary ship. This led to the belief that deck loading might be an economical method to ship pulpwood.

Since that day, I have seen big seagoing barges with loads of pineapples, in boxes the size of a truck body, coming across the open sea from Lanai and Molokai to Honolulu, there to be unloaded by crane, and I am rather of the opinion that similar transportation of bundled wood from woods to mill, where water is available, might be more economical than shipping in the closed holds of ships.

This has not been written so much as an argument in favor of the solutions proposed for the two problems cited as it is as a suggestion that scale models may at times be helpful in studying operating problems.

Slime Control . . . . . Continued from page 602

ment, but this will depend upon the severity of the slime.

Bacteriological data will indicate those points in the mill system which have the highest bacterial count and should indicate the location of points of infection. Bacteria counts taken at these points after treatment has started will indicate the effectiveness of the treatment and will aid in directing the treatment regime.

Adequate microbiological control will reduce the bacterial population which will result in the elimination of slime or a lower rate of slime accretion. The value of bacterial counts has been demonstrated. In a recent study on slime control, it was shown that there is a definite relationship between the number of bacteria present in the mill system and the formation of slime.

If the microbiological and macroscopic data do not indicate a choice of a toxicant, or if the type of paper or paperboard manufactured prohibits the use of a particular group of toxicants, it is necessary to rely upon laboratory experiments for the selection of the toxicant. However, in this selection, the choice should not necessarily be based upon the relative toxicity of the material for specific organisms but should be based upon the effect that a particular toxicant has upon the microorganisms which are indigenous to the mill system.

The method which has been used by several workers consists essentially of treating aliquots of the white water or headbox furnish with various concentrations of the toxicants. At definite intervals aliquots are removed and plated on bacteriological media and the percentage of kill is determined. That concentration of toxicant which kills 95 per cent of the microorganisms in three hours should be selected; from this value, the amount of toxicant to be added to the mill system can be calculated.

It has been shown that slug doses are more efficient than continuous doses or the application of high doses once every 24 hours. The method of application will depend upon several factors—such as the point of application, the concentration required, the effectiveness of the toxicant, and the persistence of the toxicant.

After the dosage rate has been determined, treatment should be initiated only following a thorough cleanup. The effectiveness of the treatment should be followed with daily bacteriological analyses of the system at the same points that were used in the study when no toxicant was added. In this manner, it is possible to determine the effectiveness of the treatment. Of course, the effectiveness of the treatment will be reflected in a reduction of wet-end breaks, less slime, increased quality of pulp or paper, etc.

During the course of the investigation, the bacteriological data should be correlated with slime accretion. Slime measuring units are very effective for this purpose and may even be used for predicting slime troubles. For example, with such units it has been possible to forecast excessive slime formation 24 hours in advance. These units, however, are worthless if they are not properly placed in the mill system, and bacteriological data will indicate suitable locations.

A factor which has only recently been considered in slime control is the biological activity of the toxicant while it is in the mill system. It has been the general belief that there is a gradual build-up of the toxicant in the mill system, especially if the system is closed.

Recent experimental evidence on the biological activity of slime-control agents in a mill system indicates that, as the white water content of dissolved solids and fines increases, the biological activity of the toxicants is reduced.

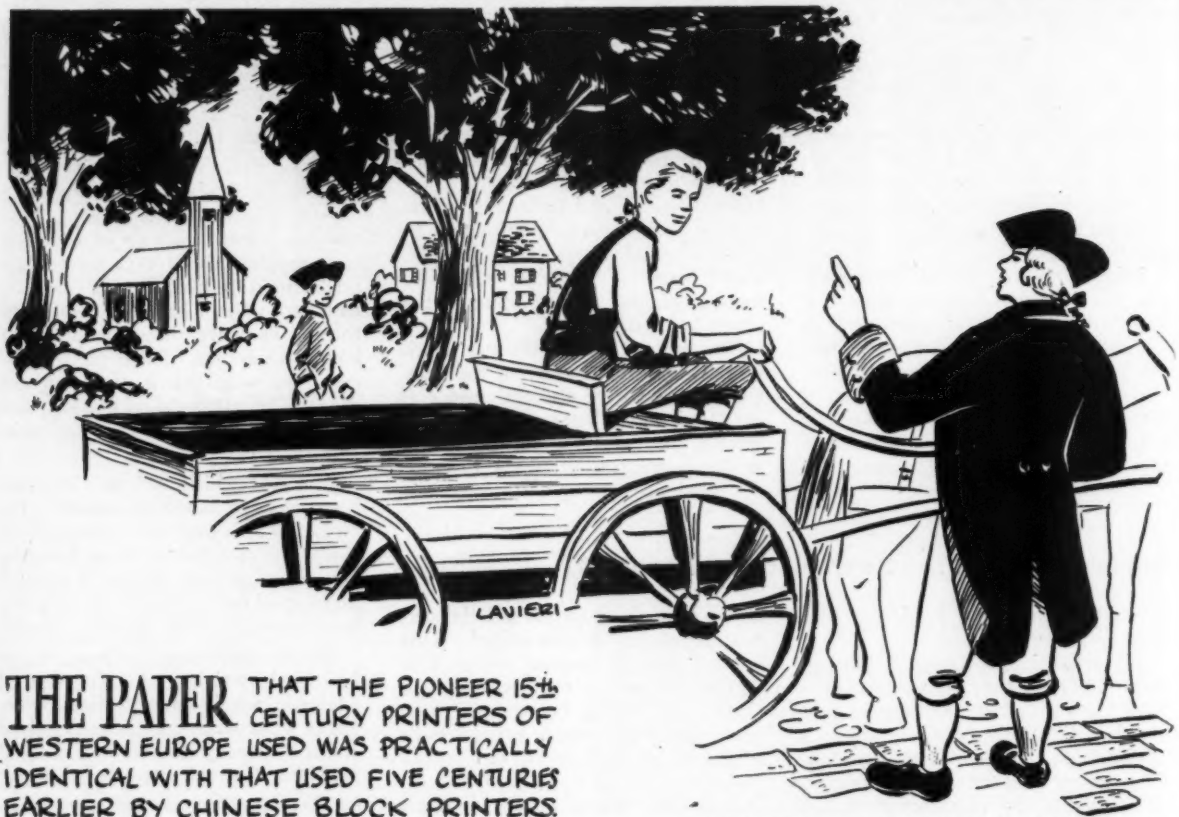
Therefore, for adequate slime control, it is necessary to follow the course of a particular toxicant in the mill system in order to determine the length of time that the compound remains toxic and the concentration of that toxicant at various points in the mill system. It is possible to add the proper dosage, as determined by test, and still not have an effective dose because a portion of the toxicant is rendered biologically inactive by the various components of the white water and/or furnish.

High Speed Coating . . . . . Continued from page 599

While the new coating machine itself is the focal point of operations in Ozalid's new plant, some of the associated equipment used in finishing operations on the coated paper command attention. Among these is an automatic roll winder which converts the jumbo rolls of coated paper into 10, 25, 50 or 100 yard rolls or sensitized paper at the rate of one roll every 15 seconds. This operation, on manually controlled roll winders, formerly required 2½ minutes per roll. Other new equipment included a huge new paper sheeter, which takes one ton rolls of coated paper, slits the paper lengthwise, and cuts it into two different sizes of sheets; two automatic paper trimmers which cut the rough sheets from the sheeter down to the final desired customer size; and a completely conveyorized packaging and labeling line, utilizing the latest assembly line techniques.

No less interesting is the new ultramodern building in which the machine is housed. Of cream and green brick construction, this three-story building contains all paper production facilities on the windowless first floor, while the second and third floors are reserved for offices, laboratories, and auxiliary production centers. The entire building is insulated with foam glass insulation.

✦ PAPER SKETCHES ✦



THE PAPER THAT THE PIONEER 15th CENTURY PRINTERS OF WESTERN EUROPE USED WAS PRACTICALLY IDENTICAL WITH THAT USED FIVE CENTURIES EARLIER BY CHINESE BLOCK PRINTERS.

IN EARLY DAYS A PUBLIC OFFICIAL IN EACH TOWN IN MASSACHUSETTS WAS APPOINTED TO GATHER RAGS FOR THE USE OF THE PAPER MILLS.

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Practical Shorts

Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

This Is Sometimes the Best Way To Remove Solid Cast Iron Pulleys

A power transmission mechanic finds that money is often saved by breaking up a solid cast iron pulley when removing it from its shaft. He states that in many instances this method is cheaper than to go to the expense and trouble of removing the shaft and a number of other pulleys and possibly finding it necessary to remove some of the hangers or machine parts in order to get the cast iron pulley off. He reports that the rim and arms break easily, which one can readily believe.

But what is of most interest is his method of removing the hub. He states that no great difficulty is found in breaking the hub, and that two men usually do the work in a surprisingly short time. One of the men holds an anvil against the top of the hub, while the other man does the striking with a sledge hammer from the bottom. In that way there is no danger of springing or otherwise harming the shaft and it is easier to apply considerable pressure against the shaft by means of the anvil from the top than from the bottom.

After getting the cast iron pulley off it is quickly and easily replaced, if so desired, by the more modern split types of pulleys which are now available in nearly all materials—steel, wood, cast iron, paper, etc.—W. F. SCHAPHORST, M. E.

▼

Filleted Keyways Help Prevent Fatigue Failures in Rotating Shafts

A shaft is weakest at the spot where stresses are most severe—the keyway. A simple improvement in keyway design lengthens the life of any shaft two to three times or more.

Keyways are necessary and will have to be tolerated until someone invents a better way to mount propellers, impellers and other moving parts on rotating shafts. A keyway always robs some strength from the shaft, since it reduces the cross-sectional area right at a point of heavy stress—under the part being spun by the shaft.

One partial solution to the problem of keyways is simple: make them as small and shallow as possible and still do a good job of locking the rotating part to the shaft. Shafts with shallow keyways are far more resistant to fatigue than shafts in which deep keyways had been cut.

An important discovery was the effect of filleting the root corners of the keyway.

Suggested Radii for Filleted Keyways

Approx. shaft diameters, inches	Keyway fillet radius, inches
3/4 to 1 1/8 incl.	1/32
1 1/4 to 2 incl.	1/16
2 1/4 to 3 incl.	3/32
3 1/4 to 4 incl.	1/8
4 1/2	5/32
5 to 5 1/2 incl.	3/16
6 to 6 1/2 incl.	7/32
7 to 8 incl.	1/4

Section of shaft taper with improved keyway. Note filleted corners of generous radius.

Section of shaft taper with square cornered radius.

Most keyways are milled with sharp corners along the bottom of the keyway slot. In a keyway with filleted root corners, the walls of the slot meet the bottom in a curve of generous radius. Aside from this difference, all other dimensions of the keyways and shafts under test were exactly the same. In the fatigue tests, this simple expedient of filleting the root corners of the keyway nearly doubled the number of blows needed to break the shaft.

The reason why filleted root corners increase the fatigue resistance of a keywayed shaft is quite simple. The sharp corners of the old-fashioned keyway are focal points for the development of stresses. The curved profile of the filleted root corner effectively eliminates this trouble spot, greatly increasing the life of the shaft.—From *Mechanical Topics*, published by THE INTERNATIONAL NICKEL COMPANY, INC.

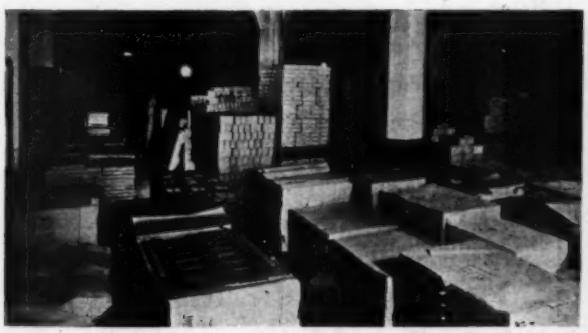
▼

Racks Solve Congestion Problem

A Chicago printer eliminated the storage headaches which confront most publishing, printing and paper houses faced with warehouse space shortages.

Here were the problems: (1) Storing miscellaneous sizes and kinds of printing paper so they would be quickly available for the presses; (2) Storing customers' printed forms, to be ordered out as needed; (3) Conserving limited space for traffic and other purposes.

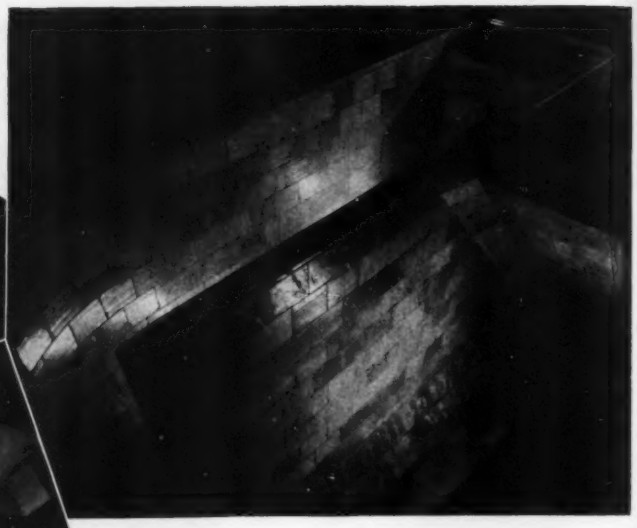
Double layer pallet racks completely solved the discouraging problems this printer faced for years. Today, the company's general superintendent reports that his paper is neatly stored and accessible for use on the presses, the printed forms are stored on the second level, segregated for quick handling and shipping, and in addition, the valuable floor space this paper once occupied is now used for traffic and other operations. —UNISTRUT PRODUCTS CO., 1013 W. Washington Blvd., Chicago 7, Ill.



BEFORE—(left)—A. R. Barnes & Co., Chicago printer, had storage problems, all of which were solved by use of pallet racks. AFTER—(right)—Printer now has paper neatly stored and accessible for the presses. Finished forms also are neatly stored for handling

It's a Beautiful Chest

One of the Many Uses of KALAMAZOO Glazed Tile



Same chest in operation. Note the smooth, even flow of stock.

This cycling chest is built entirely of Kalamazoo Glazed Tile. It provides a smooth-flowing surface for stock and is particularly adapted to different types of chests. Can be built any size or design.

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400	Gen. Elec.	MT-412	2300	440
400	Al. Chirs.	ANY	4000	514
350	Westghse.	CW	440	900
350	Al. Chirs.	ANY	440	585
300	Gen. Elec.	IM	440	450
300	Gen. Elec.	MT-410	440	450
300	Gen. Elec.	IM-17B	2300	450
300	Al. Chirs.	ANY	2300	720
250	Al. Chirs.	ANY	2300	300
250	Westghse.	CW	480	600
250	Cr. Wh.	ASR	440	600
250	Westghse.	CW-32B	440	900
200	Gen. Elec.	IM	2300	600
200	Westghse.	CW	2200	600
150	Gen. Elec.	IM	440	450
150	Gen. Elec.	IM	2300	720
125	Gen. Elec.	IM	2300	720
100	Gen. Elec.	IM	440	450
100	Westghse.	CW	440	575
100	Al. Chirs.	ANY	440	720
75	Gen. Elec.	IM	440	514
75	Gen. Elec.	IM	440	600
75	Cr. Wh.	25Q	440	600

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Australian News

Australian Paper Manufacturers, Ltd.—This company has arranged for a second debenture issue of £1,000,000 (approx. $3,000,000) to finance its post-war expansion program. The debentures will carry interest at 4 per cent. This is ⅛ per cent higher than the rate carried by the previous £2,500,000 (approx. $7,250,000) issue in July, 1945. The funds provided will be drawn on as progressive payments become due for new machinery, plant, and buildings.

New Zealand Pulp and Paper Industry—The New Zealand Commissioner of State Forests, Mr. Skinner, replying to Sir Cecil Leys, chairman of New Zealand Newspapers, Ltd., who had expressed concern that the government seemed determined to go ahead with its establishment of a pulp and paper industry in New Zealand without sufficient detailed advice and examination, said, "We are going into this with our eyes wide open." He stated that the government had conferred with pulp and paper manufacturers, with the makers of machinery, with laboratory scientists, with economic experts, and with many other experts fitted to advise on the scheme. Outlining consultations which had taken place with British, American, Swedish, and Australian authorities and experts, Mr. Skinner said that the Rust Engineering Company of Pittsburgh, Pa., had made an independent report establishing that the project was an attractive investment as well as being strategically desirable in view of New Zealand's remoteness from present supplies.

Newsprint Prices—On his return to Australia last month from a successful overseas mission on behalf of all Australian dailies, Sir Lloyd Dumas, president of the Australian Newspapers Council and chairman of Advertiser Newspaper, Ltd., Adelaide, said that the trend of newsprint prices is undoubtedly sharply downward. He explained that the whole world situation changed dramatically at the beginning of this year when the Americans ceased buying on the "gray market." He said that Scandinavian manufacturers, after a period during which they were able to sell their exportable balance for dollars at high prices, have suddenly found themselves without a market. There is a large reserve of mill capacity in Great Britain, and now that pulp from Scandinavia has moved from a seller's to a buyer's market, this may be brought into operation to produce a considerable exportable tonnage.

Coal Strike in Australia—For the last three weeks Australia has been in the throes of a nation-wide coal strike. The government has taken a very firm stand against the striking miners and their demands which include a 35-hour week and an increase in weekly wages. The government has jailed certain strike leaders and frozen union funds, declaring that it will not negotiate and that miners must return to work and submit their claims to the Arbitration Court. The government has shifted successfully several thousand tons of coal which were lying at grass and on coal pits. Preparations are also made to start open-cut mining operations with volunteer labor and Army transport. Industry has naturally been crippled and many workers are out of employment. However, the printing trade and all newspapers in Australia are carrying on as usual with the help of auxiliary power plants.

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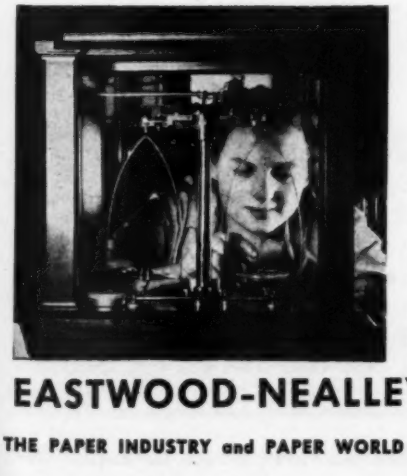
British Paper Notes

(June, 1949)

▶▶▶ As anticipated, the new license period for the British paper trade has been accompanied by the issue of a revised price list by the Paper Control.

Generally this discloses a downward tendency, in one instance rather drastic, but the price movement has not been so steep as anticipated in some quarters. Newsprint, for example, is down to £35-12-6 ton for the M.F. quality and £36-0-0 for the supercalendered, representing a drop of £5-6-3 ton. The best quality mechanical papers are now £47-2-6 against the previous price of £54-7-6 ton and wood free papers have been reduced by £7-7-6 tons to £59-17-6 for small quantities below two tons. Poster papers at £63-10-0 have receded by £8-15-0 ton, but the most surprising decline is that for engine sized wood-free banks, bonds, and manifolds, which now stand at £63-7-6 ton against the former price of £77-5-0, a decline of £13-17-6 ton. The smallest price decline is that for the esparto papers, which at the new price of £71-15-0 is only 30/- ton below the January figure. Massy produced coated papers on a wood-free body are now listed at £68-17-6, a decline of £5-7-6 ton. The speciality food wrapping papers have received fairly heavy cuts ranging up to £12-15-0 ton in the case of waxing cartridge, the new price being £62-0-0 ton and vegetable parchment is now offered at £104-15-0 ton for five ton lots. Sulphites and tissues are down over £10 ton, and pure kraft nearly this figure. The cheaper classes of browns, certain tissues, handmades, Bible papers, and imported wallboards are now exempt from price control.

The effect of these price declines on current sales is awaited. Although it is hoped that buying will revive, the first few days following this list of price revisions, have not been very promising, for, if anything, purchases are more restricted. There appears to be little doubt that apart from the possibility of fairly large stocks of paper at the merchants and printers, industry generally is retrenching, and with current news of a deterioration in the country's economic situation, this retrenching movement will continue. Incidentally, the first quarter of the present year has disclosed a sharp fall in the purchases of food, drink, clothes, and tobacco, a movement which was accelerated during April. In the paper trade



One of the Women Behind Eastwood Wires

Muriel Abrash

Operates on a "Small Scale"

On an over-all basis, we operate on a large scale, considering that we make our own alloys, cast our own plates and from them draw our own wires, wind them and weave them.

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Here in the laboratory is the heart of Eastwood's manufacturing philosophy: Proper Alloying + Control + Analysis = Quality in Fourdrinier wires.

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the position has been reached where replacement orders at some mills are not arriving sufficiently fast to keep pace with the rate of production, and it therefore seems probable that the present long time required for the delivery of new making orders will be considerably reduced. Whether some of the smaller mills will be able to stand up to the anticipated heavy economic pressure is questionable.

Meanwhile the flow of raw materials into the country is accelerating. Comparing the two periods of January-May, 1948 and 1949, it is seen that the imports of pure wood pulp have advanced by over 76,000 tons to the 1949 total of 358,142 tons, and the mechanical wood by nearly 66,000 tons to 145,282 tons. Imports of esparto grass to date are 192,075 tons, nearly 40,000 tons up on the high rate of 153,046 tons for January-May last year, but rags have declined slightly from 10,905 to 8,371 tons. Imports of paper and board have reached 173,255 tons, 190 tons lower than last year, but exports this year total 82,124 tons against 48,151 tons for the same period of last year, the greater part of this increase being due to newsprint.

Foreign Abstracts

Automatic Handling of French Raw Materials in the Paper Industry

Continuous papermaking operations have the advantage of cutting labor costs, and the author shows how this was done in a mill producing two tons of high grade carbon paper *per diem*. Flax waste was used and two cutters were placed in series. From them the fibers passed to two alternately charged and operated digesters, charged every eight hours, and then discharged into suitable tanks, which were themselves discharged every twelve hours. Subsequent pulp defibration, and the operation of a draining tank are discussed in detail. The bleaching operation, carried out in two units, is described only briefly as is the subsequent beating process.

The actual paper machine operation involved no new modifications and is barely mentioned. The over-all saving in labor is fully treated. Other applications to papermaking are outlined. Two diagrams are given. A. Renard. *Papeterie* 71, No. 4, 118-19, 121-3 (1949). (In French.)

Mild, Partial Wood Hydrolysis, Prior to Pulping

Pinewood was heated 1-2 hours in mill runs with water at 150 C. as the prehydrolysis carried out prior to the formation of dissolving pulp. The reddish brown aqueous solutions *I* (*p*H 3.6-4.0) contained about 10% of the original wood substance, at a concentration of 20-25 grams per liter. The main components in *I* were steam volatiles (such as furfural and acetic acid, most of which were lost in the relief), lignin derivatives, carbohydrates and negligible amounts of resinous products. *I* when subjected to a 6 hour posthydrolysis at 100 degrees with 0.75 *N* sulphuric acid yielded water insoluble "secondary lignin" hydrolysis fractions *II* corresponding to 1.5-2.0 grams per liter of *I* leaving a clear solution.

However, the amounts of *II* varied widely when the concentration of acid was increased and/or the time of posthydrolysis extended. When *I* was allowed to stand, the amounts of *II* also increased and their composition changed. When *I* (from which *II* had been removed) was rehydrolyzed, further, "lignin" precipitations occurred. After one posthydrolysis, *II* usually contained 64-68% carbon 5.6-5.9% hydrogen and 9-13% methoxyl. With repeated acid hydrolyses, these values fell, and the carbohydrate fraction in *I* also decreased. Repeated acid treatment caused condensations between lignin and sugar degradation products. When small amounts of furfural were added to *I* prior to posthydrolysis, the apparent *II* values increased markedly. Hence the authors look upon *II* as a condensation product between reactive lignin fragments in *I* and furfural emanating from the pentosans in *I*.

II (after one posthydrolysis) was obtained as an aromatic reddish-brown powder, insoluble in water but soluble in alcohol, glacial acetic acid and tetrahydrofuran. *II* could be fractionated from alcohol solution by successive precipitations with water or preferably with ether. These fractions (when precipitated from alcohol by gradually increasing amounts of ether) showed relatively slight variations in % composition (carbon —62-65%, hydrogen—4.9-5.9%, and methoxyl—9.6-15.2%). A fraction of *II* (58%) remained soluble in ether fraction *III*, and contained 67.4% carbon, 6.6% hydrogen and 13.1% methoxyl, giving strong phloroglucinol and benzidene reactions, and yielding a bisulphite addition product from which an oil with a vanillin-like odor was isolated, which, on vacuum distillation gave furfural, and two compounds not completely identified.

III in chloroform was fractionally precipitated with petroleum ether. The initial precipitate contained 69.5% carbon, 4.9-5.9% hydrogen and 9.2-12% methoxyl. A small fraction (17%) remaining soluble in petroleum ether contained 70.5% carbon, 8.6% hydrogen and 6.6% methoxyl (indicating that resinous materials were also occluded). *I* (*prior* to posthydrolysis) was cloudy, and on centrifuging gave a lignin-like deposit, *IV* (containing initially 64.9% carbon, 6.5% hydrogen and 10.9% methoxyl). The longer *I* stood, prior to centrifuging, the larger was the amount of *IV*, but the lower was its methoxyl content. After standing 62 days *I* gave a deposit *IV* containing 57.8% carbon, 6.5% hydrogen and 5.6% methoxyl.

In *IV* (obtained after standing 7-62 days) phenolic groups of the lignin have probably condensed with carbonyl groups of degraded carbohydrates. *I* contained *ca.* 12% *II*, 4% steam volatiles, 20% pentosans, 15% manna, 8% polyuronides *V* and 41% glucan (by difference and not completely identified). The carbohydrate fraction of *I* contained 30-70% monosaccharides, depending largely on the initial treatment. This fraction also gave color reactions for fructose, which could not be determined quantitatively.

When *I* (one liter) was passed through 50 grams active carbon, followed by washing with two liters hot water, 60-70% of the initial carbohydrates (2/3 in monomeric form) were recovered but uronic acids were absent. Lignin, furfural *et al* and polyuronides were adsorbed. When the carbon layer was dried at 50 degrees and extracted with ether, the extract contained 65.3% carbon, 7.4% hydrogen and 10.4% methoxyl. When eluted with hot aqueous sulphuric acid, the dried carbon black yielded appreciable amounts of carbohydrate material comprising largely a uronic acid which could be isolated as a barium salt and converted into the *free acid VI*, isolated as the amorphous *lactone* $C_6H_8O_6$.

The *brucine salt* of *VI* melted at 173°; *calcium salt* of *VI* contained 9.2% calcium oxide. Attempts to crystallize *VI* were unsuccessful. *VI* is not identical with glucuronic, galacturonic nor mannuronic acid, and appears to be a keto acid, probably $CH_2OH\text{-}(CHOH)_3COCO_2H$ in that it yields furfural and carbon dioxide on heating with hydrochloric acid. *VI* which appears to be an isomer of ascorbic acid, is assumed *not* to be a unit of the hemicellulose fraction of the original wood but may be linked to lignin. When *I* was electrolyzed 24 hours (15 volts, 0.4 amps.), a flocculent precipitate *VII* containing 48% carbon, 5.8% hydrogen and 8.3% methoxyl was obtained. On hydrolysis with 2% sulphuric acid *VII* yielded 25% of an insoluble precipitate containing 66% carbon, 4.9% hydrogen, and 14.8% methoxyl, whereas the solution contained 35% reducing substances (calculated as glucose) of which 8% was the barium sale of *VI*. The implications of these data are discussed at length. Approximately 40 references. A. W. Sohn and P. O. Lenel. *Das Papier* 3, 109-118 (1949). In German.

Losses of Cellulose and Wood Sugar in Pulping Beechwood

In the analysis of beechwood, two methods were used to determine the total carbohydrate content —(a) the wood was prehydrolyzed with water, and the readily removable polyoses (hemicelluloses) were determined, followed by a 72% sulphuric acid treatment of the wood residue, and (b) the determination of the resultant monosaccharides. The pulp yield in a sulphite digestion was corrected for ash and lignin, and the carbohydrates in the liquor were determined separately. When due corrections were made for the sugar degradations (resulting from acid hydrolysis), methods (a) and (b) gave nearly identical results:—68.4% and 68.8% respectively. Cellulose (corrected for pentosans) was separately determined by a modification of the Kürschner nitric acid method and was shown to be 38.6%. Lignin (22.6%) was determined by means of 72% sulphuric acid. Other values were 4.8% acetyl, 2.0% methoxyl (not in the lignin) and 2% (ash, protein and "resins").

The author claims that in the prehydrolysis there is no cellulose loss, irrespective of whether the wood is prehydrolyzed with water, with aqueous sulphuric, or with buffered aqueous solutions. On the other hand, if the prehydrolysis is followed by a kraft cook, the cellulose losses are appreciable. Untreated beechwood, when subjected to a sulphate digestion loses only 1% cellulose. When prehydrolyzed with the removal of 20% sugars, subsequent losses in the kraft cook are about 6%, whereas when 25% sugars have been removed the cellulose loss goes to 9%. Losses of this magnitude are little influenced by the nature of the kraft cook, or by the techniques used in the prehydrolysis. Residual cellulose usually had an average degree of polymerization of about 1000. The cellulose losses (after prehydrolysis) are discussed briefly.

According to the author, sulphite digestions (following hydrolytic treatments) showed no decrease whatsoever in cellulose yields (which, calculated on the basis of the original wood, were 38.8%). Methods used for determining sugars in the hydrolysates (and also for determining sugar losses) are discussed at some length. The Luff procedure for reducing sugars was used. There are very marked losses in polyoses (12-13%) when prehydrolyzed wood is subjected to the kraft cook, whereas the losses are much less (8%) when a sulphite digestion is applied.

The properties of resulting (kraft and sulphite pulps) are also compared, and the author points to the industrial implications of his data. Despite the losses in carbohydrates, beech sulphate possesses certain advantages which are also discussed. Wilhelm Overbeck. *Angew. Chem. 61,* No. 5, 219-23 (1949).

Lubricating Oils from Pine Tar and Tall Oil

One of the shortages in Finland was that of lubricating oils, and the authors give a report on their researches dealing with the formation of such oils from pine stumps (i.e. from tar and tall oil). Four detailed articles have been published.

The first one deals largely with the composition of pine stump tar obtained at the Maavesi plant. It also outlines the production of lubricating oils at the Central Laboratory at Helsingfors, which entailed the following steps: (1) the addition of small amounts of lime to the tar and the removal of volatiles at 300 C., (2) decarboxylation at 300 degrees of the resin acids by the use of suitable catalysts, (3) distillation of the product with superheated steam, and (4) washing of the distillate with alkali to remove acid products. In production, the yields of the oils agreed quite closely with those obtained on a laboratory scale.

In the second article the effects of various catalysts on resin acid decarboxylation in tall oil and tall oil pitch are described. Favoring decarboxylation were Fuller's earth (as well as an inorganic impurity in the resins). Ferric chloride and nitrate, nickel chloride, nitrate and acetate catalyzed the decarboxylation at 300-310 degrees, sodium hydroxide acted as an inhibitor. Other catalysts which were active included zinc and manganese chlorides and iron and nickel resinates. Metallic nickel was a very feeble catalyst and the hydroxides, sulphates, formates, phosphates and oxalates of iron and nickel were practically inactive. The action of iron chlorides yielded both carbon monoxide and dioxide, and gave (besides higher boiling products) abietene and abietine. Nickel acetate gave largely carbon monoxide and appreciable amounts of hydrogen and methane.

Certain activators and inhibitors are discussed. Other active catalysts were sulphuric, tungstic, phosphotungstic, *p*-toluenesulphonic and cymenesulphonic acids, naphthol yellow S. and camphor sulphonic acid; certain related compounds (like 1,4-naphtholsulphonic acid) however were practically inactive. Often only a specific isomer causes decarboxylation (like metanilic acid) whereas the others are inactive. Dehydroabietic acid carboxylates more slowly than do the other resin acids, and may be found among the products of tall oil decarboxylation. The results, which are extensive, are given in 18 tables.

The third article deals with the decarboxylation of fatty acids found in tall oil. Usually the same catalysts proved effective as in the case of the resin acids. Thus nickel and iron salts are good catalysts. The temperatures of effective decarboxylation are about 30 degrees higher for fatty than for the resin acids. When metallic iron was used catalytically, ketones (like oleone, stearone, and palmitone) were formed. Nickel acetate gave largely volatile products (including hydrocarbons) as well as carbon monoxide.

A fourth article (which requires no abstract) deals with catalytic experiments with tar obtained directly from pine stumps. Terje Enkvist (and various collaborators) (1) *Finnish Paper and Timber J. 29,* No. 22, 336-8, No. 23, 353-6; (2) *Finska Kemistsamfundets Medd 57,* No. ½, 21-61 (1948); (3) *Finnish Paper and Timber J. 30,* No. 24, 446-52, 459 (1948); (4) *Ibid 31,* No. 3, 44-7, no. 4, 61-8, 75 (1949). (The first 3 articles are in English; the 4th is in Swedish with an English summary).

Investigation on Decay in Scots Pine

The author, in two articles has made a comprehensive study of the effects of decay organisms on the sapwood and heartwood of Scots pine. Samples were taken from the lower portions of the bole in a number of trees. Blocks were cut from (a) the sapwood, (b) the outer heartwood, and (c) the inner heartwood. All of these were exposed for four months to the action of ten different wood decaying fungi. The sapwood was usually destroyed quite completely.

Marked variations were found in the case of the heartwood which is usually moderately resistant to decay. The outer heartwood, however, was usually quite durable, and only the organism *Lentinus lepideus* succeeded in causing serious attacks in this part of the wood. Resistance to fungal attack was correlated not with density or the width of the annual rings, but with the amounts of phenolic extractives in the wood. When the readily decaying sapwood blocks were impregnated with pinosylvin and its methyl ether, such blocks became more resistant to attack. Of pinosylvin and its methyl ether, the former appears to be the more universal poison. In a suitable nutrient solution it is active in concentrations of 0.02 to 0.002%. The methyl ether is more specific. It is very toxic to *Coniophora puteana* and *Merulius lacrymans,* but has far less effect on *Lentinus lepideus* and *Polyporus annosus.* Erik Rennerfelt. *Svensk Botanisk Tidsk. 39,* 311-18 (1945) (in English) and *Meddelanden Statens Skogsforsknings Inst. 36,* No. 9, 1-24 (1945) (In Swedish with English Summary).

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Convention Papers . . . Abridged

Jordan Plug Pressure Control System*

BRUNO E. PREVOST
The Emerson Manufacturing Co.

The heart of this control is a compression and expansion element. Replacing the familiar handwheel and screw found on all jordans, a suitable air motor is used to handle the movement of the plug either toward or away from the shell knives regardless of rotation. An air pressure of 60 pounds or higher in the mill system is required for proper performance of this pressure control. 110 volt current to operate the electric clock for the pressure recording chart and for the elements in connection with the several safety features of this control is required.

In early February, 1948, the jordan and control were installed and several eight hour runs were conducted with promising results. As this jordan was a secondary one on liner stock operating on a batch system with recycling, only runs of one hour to one and one-half hours were recorded with maintained pressure, while the back pressure on the jordan discharge varied from 20 pounds to 5 pounds and all the way up again. The effects of the back pressure variations were automatically compensated for by the instrument and the plug pressure remained unchanged. After various tests on different days with corresponding log sheets which included kw readings, stock pressures in the jordan, sheet tests, etc., a study revealed the necessity of some changes in our air system. We then looked for a mill where continuance of our test on an "around-the-clock" basis would reveal to us further advantages of its use versus the present manual method. For this test, we wanted a machine running continuously 24 hours a day and supplying all the stock to operate on paper machine. The S. D. Warren Company permitted us to install the control system on one of their No. 1-B Emerson Jordans.

The air line and 110 volt power having been brought to the control board beforehand, it required only three hours to convert the conventional jordan to one with automatic control of pressure between plug and shell knives. Pre-run tests showed everything in readiness on the jordan for the next day. In order to secure corresponding data on the motor while the automatic pressure control was on the plug, an Esterline-Angus watt recorder was installed on the motor input lines. The jordan was an automatic operation in less than a minute after starting time. Hour after hour passed, the recorded pressure on the chart remained constant. As the plug wanted to advance because of less internal resistance by lower stock pressure inside, the jordan tone pitch changed for a fraction of a second until the instrument responded and then proceeded to keep on the pressure line as originally set.

(*)Abridgment of an address given before The American Pulp and Paper Mill Superintendents Association at the annual convention held in Atlantic City, June 15-17.

Safety features incorporated in this system are:

1. If for any reason whatsoever the jordan motor stops, the jordan plug immediately backs off instead of grinding to an abrupt stop.

2. If for any reason the stock pump motor stops, the plug immediately backs off instead of jordaning without stock and glazing the knives or tearing the filling apart. Any way you look at it, no help is given your filling if the jordan is operated without stock.

3. If for any reason, for those who operate jordans with a headbox, the stock falls below a certain low level, the plug immediately backs off, again preventing operation without stock.

4. For those who operate their jordans under pressure or pump direct to the jordan inlet, we now have suitable arrangement to achieve automatic plug back-off if stock fails to flow to the jordan inlet.

5. In reverse, these safety features work well and profitably as follows: The plug cannot be advanced to pressure position unless the jordan motor is running, the stock pump is running and unless stock is over and above the low point in the headbox or to the jordan if pumped direct to the jordan.

Trends in Sulphite Pulping*

VANCE P. EDWARDES
International Paper Company

In many sections of the country the growing scarcity, poorer quality and higher price of non-resinous softwoods are forcing sulphite mills to look to other species, particularly hardwoods, as a source of raw materials and pines have been successfully used in the production of dissolving pulps. These woods have inherent drawbacks when substituted entirely for the longer fibered softwoods in unbleached pulps where strength and cleanliness are required. Hardwood sulphite can be bleached to a high brightness with good opacity but low strength. One important factor in favor of hardwoods, particularly birch and maple, is the high yield and low cost per cord.

High Yield Sulphite

One way to improve the utilization of softwoods, is to increase yield without affecting quality of the paper. For a newsprint sulphite a high yield pulp can be satisfactorily used and the recent development of the "Curlator" points in that direction. So far yields have been increased from 47% to 52% and it is expected that they can be further increased to as high as 72%. For higher grades of paper some increase in yield can be secured without adversely affecting quality, particularly if disc refiners are used, whether the pulp is to be used unbleached or bleached.

Where possible, the use of acids of higher concentrations than normal coupled with higher digester pressures will permit higher yields of better pulp in the same cooking time. Forced circulation, indircet cooking and proper chip distribution will result in increased yields of a better quality pulp. Coupled with a hot acid system the combination is unbeatable.

(*) Abridged from an address given before the Sulphite Group at the annual convention of The American Pulp and Paper Mill Superintendents Association held in Atlantic City, New Jersey, June 15-17, 1949.

Semichemical Pulping

While this process is not new, it has only come into commercial prominence in the last few years. The slightly alkaline cooking liquor is a combination of sodium carbonate, bicarbonate and sulphite. It is particularly adapted to hardwoods and has been successfully used, primarily in the South, for the production of boards and corrugating. Yields as high as 72% are possible and the softened chips must be opened up in various types of refiners. The color is dark but the pulp can be bleached by the use of a high percentage of chlorine and with final yields of 55%. As such it is suitable for glassine. Sodium peroxide will lighten the stock but will not change its physical characteristics.

Certain hardwoods, if cooked alone, produce a fairly light colored, strong but tinny pulp which in part replaces sulphite.

The Swing to Kraft Pulp

Both bleached and unbleached hardwood krafts have come into prominence in the past few years, replacing both soda and sulphite in certain grades.

Integrated sulphite mills have a much more difficult problem to solve than the market mills, since a shift to hardwoods would necessarily affect the type of paper produced because of the lower strength and necessity of bleaching hardwood sulphite pulps. However, there is a possibility that by the use of the proper type of refiners the strength of hardwood or hardwood-softwood mixtures can be raised to that of all softwood pulp.

The problem for market mills is not so complicated as they can shift from paper pulps to dissolving pulps without too much difficulty. In fact the trend is definitely in that direction.

Both types of mills have the opportunity to reduce manufacturing costs by the recovery of chemicals and heat value of the waste liquor and gas, the reduction of wood waste and the production of higher yield pulps.

Equipment and Plant Design

Probably the most important single advance in equipment has been the development of hydraulic barkers which have resulted in decreased wood loss, labor costs, dirt and maintenance. The most spectacular both from the standpoint of size and savings are those developed on the West Coast.

The development of whole log chippers also on the West Coast has also resulted in reduced chipper sawdust loss. The multiple knife chipper used in the East is definitely an improvement on the four knife chipper, but is comparatively more expensive to maintain properly though results fully justify the additional cost.

A vertical chipper has recently been developed which is said to produce more uniform chips and less sawdust.

Acid and recovery plant developments have been aimed at lower sulphur, stronger

acid and heat recovery. Several successful types of sulphur burners have been developed in which gas concentration is raised and in connection with waste heat boilers, steam produced.

The suggestion of burning sulphur or pyrites with oxygen or oxygen enriched air has been made and liquid sulphur dioxide has been used, particularly in the summer, to fortify the acid.

Spray coolers have replaced in part the older type with the advantage of eliminating sulphuric acid mist from the burner gas.

The advantages of strong cooking acid have led to the adoption of pressure absorption towers both in the acid plant and recovery system and the use of a stripping or tail gas tower permits uniform acid plant operation by preventing digester relief from affecting burner or tower operation.

Chrome nickel lined acid storage tanks and digesters are now in successful service. The digesters are about 25% more costly than ceramic lined digesters of the same outside diameter; have about 15-20% more capacity, and do not need to be shut down for lining with the resultant cost and loss of production.

The most recent development in blow pit design has been the use of a common pit for several digesters, with dilution and blending followed by washing over vacuum filters in series. Such a design is particularly important for complete recovery of waste liquor.

The recovery of heat and sulphur dioxide gas from blow pits is entirely feasible but has only recently been used on this continent.

Recovery

The problem of waste liquor recovery has occupied the time and effort of many investigators since the inception of the sulphite process. Up to the present utilization has not been successful, industry wise.

The problem is difficult due to the relatively low concentration of solids in waste liquor and the difficulty of economically recovering either sulphur or calcium in usable form. The tonnage of solids is staggering and the only solution which appears at present is utilization at the point of origin. The problem is further complicated by the current stream improvement legislation advocated by the States and the Federal Government.

The production of evaporated liquor or dried powder, alcohol, yeast and other products has only scratched the surface.

In Scandanavian countries with fuel high priced and scarce, a number of plants are evaporating and burning waste liquor for the fuel value only.

The most outstanding attempt to solve the entire problem—that is, chemical and heat recovery plus elimination of waste liquor discharge into streams—is what is known as the Babcock-Wilcox-Tomlinson system in which magnesium is substituted for lime and both magnesium and sulphur recovered for re-use together with very appreciable quantity of steam.

The use of sodium or ammonia as the base offers certain pulping advantages but as far as is known now, satisfactory recovery systems are not being operated. In

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conjunction with a kraft mill, the sodium waste liquors from a sulphite mill could be recovered in the kraft evaporators but the kraft production would have to be several times greater than the sulphite.

Electroplating for Paper Machinery*

CHARLES H. BELVIN
Chromium Corporation of America

Established applications of chromium plating for pulping, papermaking, and paper conversion are as follows:

Pulp production: Tubing, pipes and fixtures, chipper discs and flat screen plates.

Paper production: Beater bars, curved screen plates, centrifugal separators, "holy rolls" or distributor rolls, slice lips, breast rolls, table rolls, suction box covers, primary press rolls, sizing press rolls, suction press rolls, drying drums, breaker rolls, sweat rolls, coloring rolls and calender rolls.

Paper conversion: Coating rolls, knurled rolls, embossing rolls, drums, etc.

A number of these applications are worthy of elaboration in order to define more exactly the purpose of the plating, the type services rendered and the advantages that do accrue.

First of all, there is prompted the question: Why electroplate? The reasons are basic: Chromium resists corrosion, wears phenomenally long and enhances quality production. There is another question, and probably the prime question, whenever an intended investment in production equipment is analyzed: Will it make better paper? If it will, there is strong reason for its use. Electroplating will make better paper; it constitutes one item of quality which builds toward the final over-all attainment of highest quality. Like the strength of the proverbial chain, the ultimate measure of quality reflects the summation of all the small achievements gained throughout the whole production scheme. Viewed in this light, the intrinsic quality acquired through the use of chromium is of unaccustomed importance.

The production of paper involves a host of chemical and highly-refined mechanical processes. The exactness with which paper is produced and the uniformity of thickness, color, opacity and surface texture is astounding to the lay mind. The combination of techniques, however, is highly dependent upon precise control of the chemical reaction and the precision of the machinery which forms and finishes the sheet. The combination introduces an active corrosive environment together with abrasive forces which wear upon surfaces having an allowable variation of only a few thousandths of an inch. Chromium cannot alleviate these conditions but it can markedly reduce their effects.

Screen plates, flat, curved and perforated, are applications extensively known to the men of the paper industry. Indeed, both their acclaim and their condemnation have at times each reached crescendo proportions. Yet, after twenty odd years of being a strong field contender, they operate today in many mills as the most economical plate in use, and, in a comparison of satisfactory performance, the equal of any others. A screen plate represents a particularly difficult contour for plating due to the recessed pattern of its milled and sawed slots, therefore as much research is now being directed toward an improved production as has been exerted in the past. The job represents a real challenge and while some platers feel they have done well with it, there is no slackening in the desire to do better. Through actual field experience there are known positions where plating falls victim to corrosion but corrosion can be eliminated and, given long enough, we shall lick it. By the same token, there are known positions wherein the performance of plating is highly satisfactory and the employment of chromium open-back plates is conducive to durable screens, fast stock movement and use of minimum slot widths. On numerous occasions in years past mills have been troubled with stringing under the plates, clogged slots, too rapid slot wear, etc. Chromium plating was used to alleviate these handicaps and in the great majority of cases it has been used ever since. One of the significant factors is the continued use of chromium plated screen plates once a mill has extensively employed them.

The baskets of centrifugal separators constitute an application wherein the smoothness of chromium plating performs to good advantage. In operation, extensive forces are set up in a horizontal plane, and under this pressure, a very low-consistency mat of fibers is formed against the inside of the basket. Any roughness, particularly on the annular riffle rings, will catch fibers and otherwise impede the movement of stock from compartment to compartment of the rotating basket. Chromium plating may be applied as a measure to maintain a smooth, relatively low-frictional surface over polished bronze or stainless steel and thereby assist stock movement. With fine tissue papers it is particularly effective in minimizing the stringing and knotting of stock. Plating further aids in rapid and thorough cleaning of the hard-to-reach portions.

Throughout the wet end of the fourdrinier there are numerous rolls which may be nickel plated or chromium plated for the prime reason of inhibiting against corrosion. In the case of high speed machines this becomes doubly important in view of the fact that rolls must be dynamically balanced. Uneven wear and corrosion will prompt a maladjustment of balance and introduce a whipping moment into the high speed rotation. Corroded or uneven rolls logically will limit wire life and have a detrimental effect upon smooth machine operation, while electroplated rolls will maintain new-equipment efficiency with rolls which otherwise would require resurfacing at more frequent intervals. For table, breast, wire-carrying and kindred rolls, the use of nickel plating is outstanding for it inhibits thoroughly against corrosion, is less expensive in production than chromium and provides a hardness that is equal to or greater than the hardness of steel. These plated rolls have a habit of paying for themselves through improved endurance, performance, product, and output.

Within your industry the plating of rolls is the most outstanding and extensively followed application. Those, such as press rolls, compel the maintenance of exact dimensions and clean operations. Chromium can be applied to maintain dimensional accuracy and reliably preclude wear and etching for periods of time long after usual surfaces would have become etched or worn beyond the limit of allowable variation.

As a further enhancement, the chromium affords smoothness, freeness from pick-up and fuzzing and permits very rapid clean-up which accompanies the changes in the type of paper being run or alterations in dyes

(*)Abridged from a talk given before the Fine Paper and Tissue Group of the American Pulp and Paper Mill Superintendents Association at Atlantic City, New Jersey, June 16, 1949.

SULPHITE MILL ACID PLANTS
SULPHUR BURNING PLANTS
JENSSEN TWO TOWER ACID SYSTEMS
GAS COOLERS—SURFACE AND SPRAY TYPE
JENSSEN PRESSURE ACID SYSTEMS
JENSSEN AUXILIARY PROCESS TOWERS
RECOVERY PLANTS—COOKING ACID
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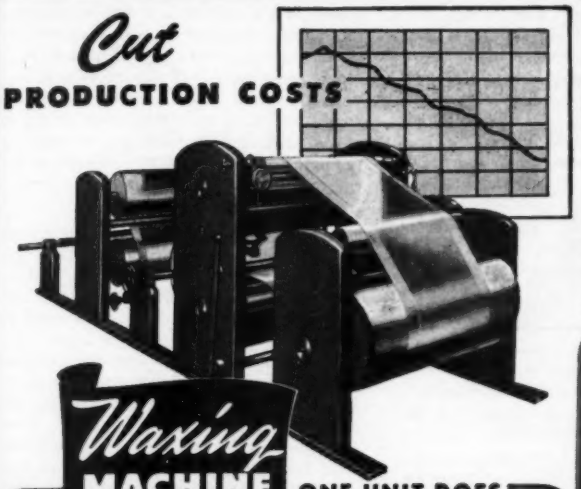

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and tints. Experience has shown that the introduction of an open grain finish for primary press rolls has had a distinct advantage over smoothly finished rolls. It is quite possible to get chromium so smooth that fiber attraction to the surface is accentuated and the roll will pick fibers more acutely than will other finishes. This adhesion may be interrupted by graining the surface, a technique which presents a surface heavily populated with fine, symmetrically spaced pockets, each of which will harbor a small bubble of air as the sheet enters the nip. The air will compress and will tend to explode the sheet from the face of the roll after it is passed through the nip. The press surface remains a smooth plateau but precludes over-all intimate contact of the sheet to the roll without loss of any of the desirable pressing characteristics.

Nickel-plated and chromium-plated drying drums constitute an admirable application, particularly in positions that follow a press section, a size press or a coating operation. Several mills are going to plated dryers at the initial 2 to 4 positions of the wet end. Some of the number one drums are doctored. This plating gets the sheet off to a fine start toward a superior product.

The conventional drying drum is made of welded steel or cast iron, both of which are susceptible to corrosion (with consequent discoloration of the sheet) and sticking under the wetted condition of the web at the initial dryer position. Here the plating characteristics resistant to corrosion are the most outstanding but a secondary feature is the minimization of troublesome sticking that can so easily occur at the particular dryer position. Special finishes are not required as the routinely and accurately ground surface of the ferrous metal, plus light polishing of the chromium after electroplating, produce a finish with a ground appearance, including light emery marks, but of sufficient lustre to enhance the finish on the sheet and permit its easy release.

Coating rolls and drums form a classification all to themselves for chromium plating has been found to be nearly indispensable with a number of preeminent systems for roll coating both as a conversion operation and as a paper machine operation. It has established and maintained the standards by which roll surface finishes are gaged.

The use of chromium with coating rolls forms a natural parallel. Both are directed toward superior surface finish and in many cases the uniformity of finish obtained with the coating may be attributed directly to the maintained uniformity of the finish of chromium plated rolls and knives. Of the several basic roll coating operations in popular vogue practically all utilize chromium to some extent. As an example we cite an offset rotogravure print coater. The print roll, which has a designed surface and is doctored, serves to meter the quantity of coating material which is transferred to the offset roll and in turn to the sheet. Now there are numerous variable factors including the consistency of the coating, absorbency of the paper, the retentive qualities of the roll faces, surface tension, etc. The key to the formation is the print roll and chromium is used to stabilize its operation. It is significant that the wetting characteristics, or lack thereof, of chromium are such that a uniform quantity of coating consistently is released from the design of the print roll. Other metal surfaces will not do as well. In addition, there is minimum wear under the doctor blade and the design may be preserved by stripping and replating the roll without reengraving.

Another interesting position is the coating roll of the reverse roll coater. Plating is used to secure an accurate face which in turn maintains the correct peripheral speed of the geared rolls. It also facilitates cleaning and presents an immunity to rust spots and discoloration.

The profound exactness of metering rolls is maintained through use of chromium more than any other conventional method. A very substantial contribution toward uninterrupted processing and uniformity of coating thickness over months of operation directly parallels the employment of chromium.

Perhaps with converting operations, chromium plated embossing rolls represents the application best known to tissue manufacturers. The fundamental utility served here is preservation of the sharpness of the design. Conventional embossing rolls are engraved upon relatively fine and soft grades of steel. Over the pattern may be set a shield of chromium which protects the pattern against abrasion and produces phenomenally increased life in the fineness of the design. Outstandingly here, and to a lesser extent in other operations, the use of

electroplating lends itself to stripping and replating without change of the engraved design. Through experience an operator may determine the life to be expected from a plated embossing roll. As the point of wear-through approaches, and prior to the time that disfiguration of the design may occur, the plate may be removed chemically and a succeeding plate applied for restoration of the pattern to its original contour. Essentially this measure provides a new roll. Use of this feature of replating without distortion of the foundation metal is used to advantage with small tools and machine parts.

Another feature of electroplated chromium which should be made a part of this discussion is the asset of eye appeal. It is a recognized industrial feature that clean, tidy, well appearing equipment will prompt the same factors in the production of workers. Chromium presents such a feature. It is free of tarnish, easily cleaned, has a bright appearance at all times and these qualities may not be lightly regarded in the production of any items which carry quality as a watchword. So chromium is hard, is corrosion resistant, is all this and handsome, too. It naturally looks good; it is good!

Lubrication and Its Effect on Paper Mill Operating and Maintenance Costs*

J. P. CRITCHLOW[1] and D. R. KROELL[2]

Lubrication is the basis of preventive maintenance, which is far less costly than corrective maintenance. In other words, an ounce of prevention is still worth a pound of cure.

(*) Abridgment of an address given before the Power Group at the annual convention of The American Pulp and Paper Mill Superintendents Association held in Atlantic City, New Jersey, June 15-17, 1949.

(1) Lubrication Engineer, Industrial Division, Gulf Oil Corporation, Pittsburgh, Pennsylvania, (2) Lubrication Sales Engineer, Gulf Oil Corporation, Boston, Massachusetts.

One of the most important savings that can be made through scientific lubrication—and one which is often overlooked—is the saving in power consumption by reduction in frictional losses. For example:

Actual tests on an electrically driven newsprint machine showed approximately a 30% reduction in starting load and a 10-20% reduction in running load by changing the type of lubricant and the method of application on dryer journals.

In another mill where the machine turbines were loaded to capacity, a change in the type of lubricant and method of application on dryer journals reduced the running load so that machine speeds could be increased 300 fpm with the same turbines.

Another example is that of a screen driving motor which would not stay on the line. A check of the power consumption indicated that this motor was overloaded approximately 100%. By changing the type of grease in the anti-friction screen bearings, the power consumption was decreased to motor capacity, which represented a 50% reduction in the power consumption of this unit. It is not inferred here that this example represents any tremendous saving in power, but it does serve as an excellent example of how the right lubricant in the right place can help to maintain trouble free production in a paper mill.

It might be well at this point to discuss briefly just how the proper lubricants can reduce power consumption or the load on a machine. As you all know, the mechanical efficiency of a machine is represented by the ratio of the output over the input. The difference between the two are the frictional losses. There are two types of friction found in machine elements—metallic friction and fluid friction. There is possibly a third type which is a combination of metallic and fluid friction such as is found in machine elements operating under so-called boundary conditions. Metallic friction is that occasioned by the contact of two unlubricated metallic surfaces, and results in the generation of considerable heat, excessive wear, and, naturally, a high power loss. Fluid friction is the result of the shear of a lubricant film separating two surfaces moving at different speeds.

Heat, of course, is also generated in this instance. The job is to replace metallic friction with fluid friction. By so doing, input to machinery can be reduced or the output can be increased, resulting in higher machine speeds and increased production. Wear on machine elements will also be minimized resulting in fewer replacement parts, lower maintenance costs and uninterrupted production.

Metallic friction is occasioned, in some instances, by machine elements being completely neglected in so far as lubrication is concerned, or because of the nonfunctioning of lubricating devices due to injury or through becoming clogged with contaminating materials. A careful survey of the entire mill will reveal these trouble spots. More often, however, metallic friction will be found in those bearings (particularly in the dryer section) which are operating under boundary lubrication conditions. Under these conditions, there is intermittent contact between the bearing and the journal. They result when the bearing design speed, load or method of lubricant application are not favorable to the formation of an oil film and the bearing does not operate under the laws of fluid film lubrication.

When bearings are found to be operating under boundary lubrication conditions, an investigation of the contributing factors is absolutely necessary. Many times it will be found that the lubricant is being applied at a point where it is completely ineffective in so far as forming an oil wedge is concerned. If at all possible, the lubricant should never be applied into the pressure area of a bearing. By simply changing the point of application of the lubricant, fluid film lubrication can be obtained and metallic friction eliminated.

In other instances, it will be found that loads on the bearings are high and the rubbing speed of the journal is below the minimum rubbing speed at which a full fluid

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oil film can be developed. For such conditions a lubricant having higher oiliness and film strength characteristics should be used. The two examples mentioned previously are excellent illustrations of what can be done on some dryer sections by changing the type of lubricant and the method of application.

Fluid friction can be reduced to a minimum by the selection of the proper lubricant for a given application. In any given plain bearing operating at a given speed and load there is an optimum viscosity for the lubricant. The use of any lubricant heavier than this will result in the generation of enough heat through fluid friction to raise its temperature to the point where its viscosity approaches the optimum. As you know, the viscosity of petroleum oils decreases with an increase in temperature so it follows that the heavier the oil installed in a plain bearing above the optimum, the higher its operating temperature will be, and, naturally, the higher the friction losses.

As mentioned previously, the greatest opportunity for savings through efficient lubrication is in the dryer section so more time will be spent on this phase of operations than the others.

You all are, undoubtedly, familiar with the various types of dryer bearings and the methods used for lubricating same. It is beyond the scope of this paper to do more than mention these various types.

In slower speed and older machines, dryer journals are often equipped with plain open brass or bronze bearings and are usually lubricated with block greases. Journal temperatures using block grease have been measured anywhere from 175 Fahr. to 300 Fahr. and it is practically impossible to make one block grease which will satisfy all conditions. Block greases that will function properly at temperatures around 300 Fahr. will not feed at low temperatures which results in a starved bearing.

On the other hand, block greases which perform satisfactorily at low temperatures will melt down too rapidly at high temperatures. In other words, conditions on each machine must be studied before a proper lubricant recommendation can be made. A good block grease has some advantages, such as ease of application and the elimination of run-off. One disadvantage is that they usually provide only boundary lubrication which results in high starting loads and, generally speaking, high running loads. Block greases should be checked weekly to note whether the surface in contact with the journal is glazing or carbonizing. This surface should be oily and slightly spongy to the touch.

Similar bearings are sometimes oil lubricated, the oil being applied by such devices as bottle and wick-fed oilers; some use a combination of block grease and oil, others are waste packed. still others are ring, chain or collar oiled. Most of these bearings still operate, however, under boundary conditions, but in general their starting and running loads are less than those bearings which are block grease lubricated.

All of these devices have been used successfully under certain conditions. In general, bottle oilers should be limited to slower speed narrow machines where journal temperatures are below 200 Fahr. An oil having a viscosity of 600 SSU at 100 Fahr. is satisfacory. Wick feed devices have a wider range of application and have been successfully used on machines up to 1100 fpm—160 inches wide with journal temperatures up to 270 Fahr. Their adaptability to a wide range of conditions results from their ability to utilize higher viscosity oils, and to vary the rate of flow by increasing or decreasing the number of wicks. Depending on the particular machine and its operating conditions, oils with viscosities from 600 to 2000 SSU at 100 Fahr. are generally used.

The type of wicks used is very important, particularly when it is desired to control the rate of feed. Strips of wool cut from wet felts are often used, but are difficult to regulate properly and their use is not recommended. Four strand wool wicking is most satisfactory and is generally available. Care must be taken to insure that the wicks do not become clogged inasmuch as, if not occasionally cleaned, they will gradually feed less oil. Run-off on these devices is apt to be excessive and result in oil staining the edge of the dryer felt and shortening the felt life. With the correct oil, proper wicks and intelligent supervision, however, they are very satisfactory and generally give low starting and running loads.

This same type of bearing, on some machines, is also lubricated by means of rings, chains or collars, which dip into an oil reservoir and carry oil to the journal. This type of lubricating system has been successfully applied to various types of

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machinery including paper machines. When it is applied to dryer journals the oil used should be of high quality and extremely stable inasmuch as it is subjected to very severe service, being rapidly re-cycled and continuously exposed to the high temperatures which are typical of such installations.

In addition there is always the possibility of contamination of oil by paper fly dust, etc. All of these factors cause an oil to oxidize quite rapidly. The products of oxidation will build up in the oil reservoir, if not properly handled to the extent where the ring, chain, or collar will become inoperative and the bearing starved. It is imperative that only high quality lubricants be used in these systems and that the oil be changed frequently. The oil reservoir should be flushed at each oil change.

Frequency of oil change must be governed by conditions peculiar to each machine. It is well to remember though that the rate of oxidation for petroleum oils doubles for each 20 Fahr. rise in temperature. You can readily see that the higher the journal temperature the more frequently the oil should be changed. It is also well to remember that journal temperatures vary widely from the wet end to the dry end of the machine, and that the back side journal temperatures are generally higher than those on the front side. All of these conditions should be taken into consideration when establishing oil change frequency.

To some dryer sections equipped with ring or collar oiled bearings have been added circulating systems. These permit cooling of the oil and the removal of contaminants and oxidation products before reintroducing the oil to the bearing. Oil is usually introduced to the top of the bearing, and the oil level in the reservoir maintained by an overflow. The rings or collars function as before. With such an arrangement, the oil is not subjected to as severe service, but by continuing to use the rings or collars and maintaining the necessary oil level, it is still impossible to completely renew all of the oil in the reservoir on each cycle. By providing for a more rapid rate of feed, however, it is possible to eliminate the rings or collars and remove the oil from the bottom of the housing, thus renewing the oil in the reservoir on each cycle. When properly filtered, the oil in such a system will remain in good condition indefinitely. Of course the oil should be of the highest quality and have good water separating characteristics. The life and service of the oil will depend almost entirely on how efficiently it is handled.

Circulating oil systems are also employed for dryer bearing and gear lubrication on the newer, larger high speed machines. These machines use both plain and anti-friction bearings and represent the latest in paper machine design.

The problems presented by those machines using anti-friction bearings are somewhat different than those discussed previously for other types. If the bearing housings are designed and arranged so that the bearings can be easily inspected both on the front and back side, and if the oil enters and leaves the housing in the proper place, these new machines leave little to be desired from a lubrication standpoint.

These newer machines operate at much higher speeds than the older machines and in some instances are using steam in the dryer drums up to 100 lb per square inch. These high steam temperatures naturally result in high journal temperatures. Such temperatures, plus water, paper fly, and other contaminants, subject the oil to severe service. The oil is required, of course, to adequately lubricate the bearing which, as mentioned previously, is fairly simple.

In addition, the oil must protect the bearing against corrosion due to moisture and maintain the bearing and housing in a clean condition, as free from deposits as possible. To meet these requirements the oil must be of a high quality so that it will have maximum resistance to oxidation. It must contain additive agents that protect metal parts against corrosion due to moisture. It must also be able to separate readily from the water it picks up from the system.

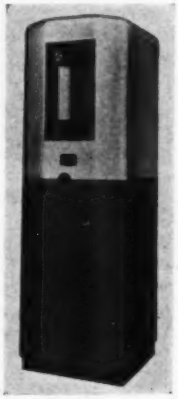
In addition to lubricating the bearing the oil also serves as a flushing medium. In performing this latter function it cools the bearing and carries water and other contaminants to the filters and settling tanks where they can be removed from the oil. In order to efficiently perform this function an adequate supply of oil must be admitted to the bearing. In general, three pints per minute per bearing has been found to be satisfactory. This figure might

(Turn to page 626)

New Products . . . . . .

Chlorine Gas Feeder

Designed to meter chlorine gas and produce chlorine water solutions.



Builders Providence, Inc., Providence 1, R.I. has available a new chlorine gas feeder which incorporates a positive chlorine rate indicator with direct reading linear scale.

The chlorinizer is an attractive, enclosed unit which is readily adapted to semi-automatic, program, or automatic proportional operation and conversion from one method of operation to any other may be made in the field.

Test Benches

Can be had in any length and a variety of designs.

Fisher Scientific Co., 717 Forbest St., Pittsburgh 19, Pa., has available eighteen different all-steel units, including drawers, cupboards, sinks, tables, storage cases, etc.,

that are designed to be joined easily, to form test benches either 30 in or 36 in high. Units are two, three, four or five feet in length. The working surfaces are made of the plastic-impregnated stone called Kemrock which is claimed to be extremely resistant to ovens and chemically corrosive materials.

Paper Counter

Instant paper and card counting.

Introduced a year ago, the electronic paper counter, manufactured by Potter Instrument Company, Inc., 136-56 Roosevelt Ave., Flushing, N.Y., now includes a number of improvements.

The improved counter is recommended for use on all paper down to a weight corresponding to sub 16 on a 17 x 22 in basis, and is used for determining the quantities in printing operations, inventory work, counting greeting cards, stationery, etc., in print shops, supply houses, offices and elsewhere. Sheets and cards may be counted at rates of 300 per second, the operation be-

ing so rapid that the count may be repeated several times to check results.

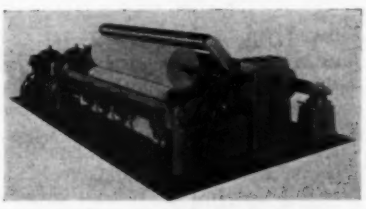
The sheets or cards are "riffled" by hand and the pickup, resembling a photograph pickup, is moved down the edge of the cards and the count read directly on the electronic counter. All standard weights of paper and cardboard may be counted satisfactorily with this device.

Winders and Rewinders

Built for high-speed and high production winding of a wide range of papers.

Extensive engineering research by Appleton Machine Co., Appleton, Wis., has resulted in the manufacture of new two-drum winders and rewinders with slitting attachments.

One of the outstanding features of this equipment is the riding roll which is claimed to have eliminated the cumbersome superstructure with its counterweights, chains, gears and other accessories. The roll is carried on swinging arms that automatically decrease in line pressure as the weight of the paper roll increases, assuring uniform density from the core to the circumference. It can be retracted as required, is raised and lowered hydraulically and the pressure can be increased or decreased during any portion of or during the entire wind up. Operating controls are grouped on a control



panel which allow complete and accurate command of tension and threading, starting, running, jobbing and stopping. It permits a wide range of speeds, rapid acceleration and deceleration and smooth speed changes for fast, even winding.

The core shaft mechanism is new. A lightweight core shaft is used and carried on vertical columns that are raised or lowered simultaneously, adjustable for leveling to correct hard or soft ends due to unequal caliper. The weight of the core shaft and mechanism does not affect the hardness of the wound roll as the weight is compensated for by counterbalance and counterweights inside the rear frame. Also a new feature is the hydraulically operated ejector roll which does not mark the paper roll nor bend the lightweight core shaft, and which is interlocking with the riding roll to prevent simultaneous operation.

The winders incorporate the score-cut method of slitting with an improved demountable type, lightweight aluminum holder. The knife spindle is ball bearing mounted and removable, and the knives are guarded. Each slitter may be removed, respaced or adjusted independently.

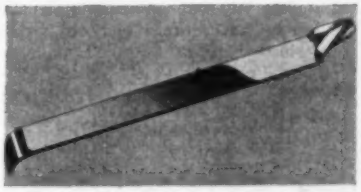
Included among the electrical features are the optional electric eye side register for correcting telescopic rolls, positioning the parent roll and a paper break switch which automatically stops the entire drive in the event of a break in the sheet.

Models of these winders are furnished in different sizes to meet mill requirements, and perform at speeds of 3500 fpm and higher.

Staple Puller

Removes all types of staples from any surface.

American Machine Works, Inc., Racine, Wis., has available a new type staple puller with a hardened steel, slotted, lifting prong which removes both standard and heavy gauge wire staples without tearing or marring fastened surfaces.



Pressure of the lifting prong is applied directly to the staple legs rather than the crown which results in removal of an unbroken and straightened staple. It is convenient to use in conjunction with wire stitching machines, opening cartons and boxes, and in drafting rooms and engineering departments to remove drawings from drawing boards. It is available in either satin or polished nickel finish.

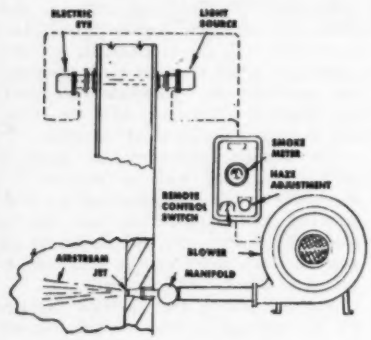
Smoke Abatement System

Suitable for all industrial applications.

Eclipse Fuel Engineering Company, Rockford, Ill., has developed a system for smoke abatement which utilizes the basic principle of forced air to eliminate objectionable smoke.

After extensive tests on a wide range of applications, the company claims that formation of smoke or soot can be prevented only by complete combustion within the firebox. This is accomplished by forcing air through jets into the firebox, causing complete combustion before the volatile gases have had a

chance to break down into soot or smoke. It is further stated that an overfired air jet system is the most efficient and inexpensive method of controlling smoke and this company offers two different air jet systems, the single manifold and the double manifold Eclipse Centrifugal Pressure Blower.



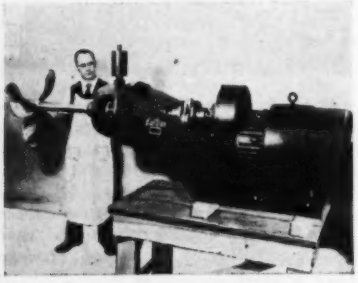
Controls for the systems are manual or automatic, and under visual-manual control a push button station is used for a manual start and stop of the blower. Mirrors can be used for observation of the stack. If automatic control is desired, a photoelectric cell is installed in the stack and interconnected with the blower starter.

Side Entering Mixer

Stuffing box can be repacked without emptying the tank.

Eastern Industries, Inc., 296 Elm St., New Haven 6, Conn., has announced the development of a new side entering mixer.

This unit is designed to supply complete agitation of large quantities of liquids under severe operation conditions. Repacking the stuffing box without draining the tank is done by means of an outboard sealing ring which seals off the shaft while replacing the packing.



The mixer consists of a heavy duty induction type motor, Moreflex coupling, special double packed type stuffing box with sealing ring, and shaft and propeller which are available in several types of corrosion resistant alloys. Motors are 10 to 30 hp and are available in all enclosures and for all voltages.

Speed Reducer

No costly supports or special foundations are needed.

The American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29, Pa., has developed a new vertical speed reducer which is adaptable to such process industry operations as agitation, homogenization, paddle mixing and beating.

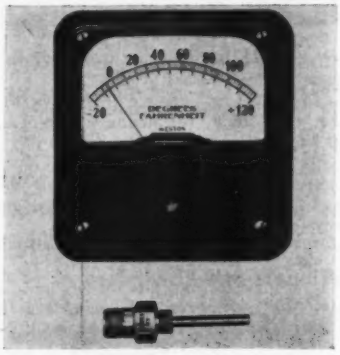
The reducer weighs only ½ to 1/3 as much as comparable units and requires little headroom. Any driven speed below 154 rpm can be provided from standard stock parts and the manufacturer claims it offers a vertical speed reduction drive at a cost only slightly higher than that of a horizontal speed reduction drive.

The unit is built for mounting on the shaft of the driven machine, and can be selected and installed from simple catalogue information.

Electrical Thermometer

For remote and multiple indications.

A new electrical thermometer, known as Model 918, has been announced by the Weston Electrical Instrument Corp., 617 Frelinghuysen Ave., Newark 5, N. J. Designed for industrial applications where remote indications are necessary, this thermometer employs a sensing element known as a resistor bulb, which can be placed in



tanks, grain bins, machines, etc., with the direct indicating instrument mounted any reasonable distance away from the bulb. By means of a selector switch and multiple bulbs, a number of temperature measurements are possible while using but one indicating instrument.

Model 918 can be used for continuous remote indicating temperature of molds and baths, oil storage tanks, calender rolls in rubber plants, dam water for power plants and waterwheel and turbine bearing temperatures.

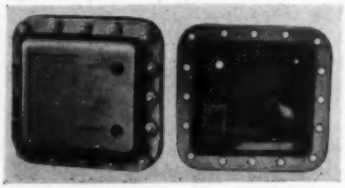
The thermometer is described as a ratio-type instrument with a scale over 5 inches long, and can be used on 100-130 volts, 50-60 cycles a-c. It also can be supplied for use on d-c.

Flow Trap

Instant removal of condensate from steam, gas and compressed air lines.

A steady, continuous, uniform flow trap has been developed by W. S. Rockwell Co., Fairfield, Conn., and is designed to eliminate alternate "fill and spill," steam and heat losses, steam, air and gas pressure drops, air binding, freeze-ups, hammer, chatter and other difficulties encountered in the use of intermittent discharge traps.

The large capacity trap is easily installed into air or fuel separators, line purifiers, gas accumulators, superheated drains, process tanks, after absorbers, pipe lines and other steam storing or conditioning equipment. Steam, gas or air condensate mixture enters the trap above the condensate, not below or through it. A slide valve and float mechanism regulates flow of condensate according to the volume of condensate accumulation in the trap. The outlet valve seals tightly when there is no condensation taking place thereby preventing unnecessary steam and heat losses. Moving the



drainage lever on the cover holds the valve open and the trap is blown clean of condensate or foreign matter by the steam, gas or air pressure. Movement of the slide valve vertically over the orifice with the rising or lowering of the float helps prevent short-circuiting of vapor, while the cutting action of the slide continuously frees the valve orifice of sludge in the line. There is no valve seat wear. The entire stainless steel mechanism is easily inspected and cleaned without breaking the line or removing the trap.

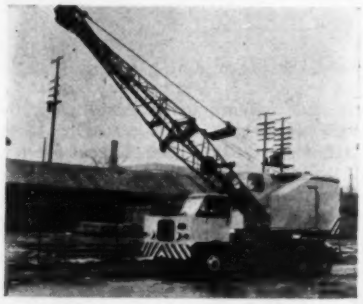
The steam trap is available in screwed or flanged types for ½ in, ¾ in and 1 in pipe sizes and for pressures of 150 psi and 300 psi and temperatures up to 750 Fahr. Orifices are interchangeable. Inlet and outlet are located on the same side of the housing thus providing for a by-pass.

Truck Crane and Carrier

Designed for simplicity and ease of maintenance.

Northwest Engineering Co., 135 South LaSalle St., Chicago, Ill., has announced a new truck crane and carrier combination.

The crane has a capacity of 20 tons. The boom length for a crane work is from 30 ft, minimum, extendible to 100 ft by addition of standard intermediate sections. Main operating machinery of the crane is mounted



on cast steel side frames and high-speed shafts are mounted on ball or roller bearings.

The carrier has a box type truck frame that is reinforced the full length of the carrier. Outriggers extend the full width of the carrier and have unusual bearing support when extended. Forward outrigger is positioned close to the rear wheels to relieve the carrier of a greater amount of

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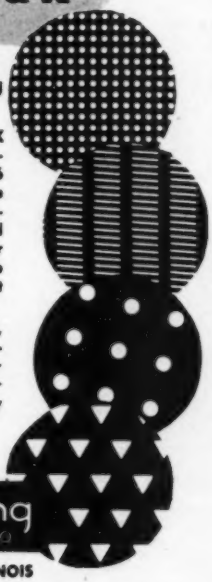

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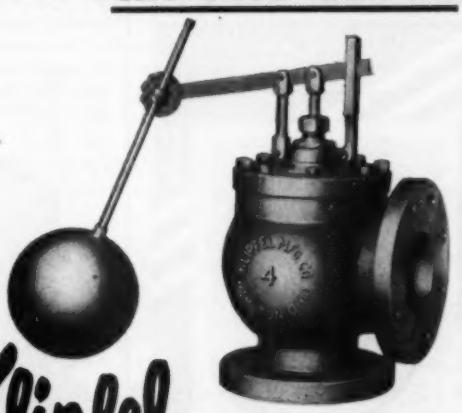
SOUTH NORWALK, CONNECTICUT, U. S. A.

...TO KEEP LIQUIDS "ON-THE-LEVEL"



Klipfel FLOAT VALVES

- For liquid level control that's really automatic, depend on Klipfel Float Valves. They have a forty year record of dependability on thousands of installations, large and small, water and chemical, throughout the land.
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- Also available with Klipfel's exclusive cup disc inner valve for tight control for liquids injurious to rubber and leather, and for higher pressures.

For complete details, write Dept. AY-8 for Bulletin 346. Float Valves, Reducing Valves, Tank Thermostats, Back Pressure Valves.

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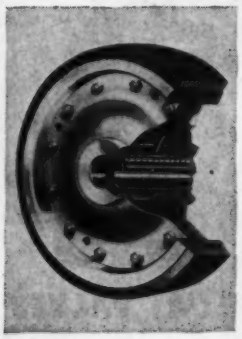

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stress. Rear outrigger truck is demountable and makes it possible to change from crane work to shovel, dragline or pullshovel work without repositioning the lower base for the crane.

Single Phase Motors

Available in open dripproof, splashproof, totally-enclosed, fan-cooled and explosion-proof construction.

Louis Allis Co., Milwaukee, Wis., has used a new approach in the design and construction of its recent line of integral horsepower, single phase motors.

The centrifugal switch, formerly used to disconnect the starting condensers from the line after the motor is up to speed, has been replaced by a voltage relay which is

mounted in the control cabinet. Included in the control cabinet is an across-the-line starter and necessary capacitors which make possible the removal of the capacitor enclosure on the motor itself.

The motors are built in capacitor start-induction run types in ratings of 1 and 1.5 hp and in capacitor start-capacitor run types in ratings of 2, 3, 5, 7.5 and 10 hp. Capacitor run types are supplied with oil type running capacitors also mounted in the control cabinet. It is claimed that this two value type of capacitor motor is a marked improvement in the efficiency and power factor over the single value type, and is much quieter in operation.

Flame Failure Protection

For semi-automatic and manually ignited industrial oil burners.

Construction Control Corp., 77 Broadway, Cambridge 42, Mass., has announced a new control which is called Fireye System FF-3.

This system includes photoelectric scanner type 45PH5 consisting of phototube and vacuum tube amplifier housed in a dust-tight aluminum case and control type 24QJ5 consisting of two relays and a power transformer housed in a dust-tight steel case.

45PH5 is mounted on the burner mounting plate so that it has a clear view of the oil flame and when flame fails instantly signals control type 24QJ5 which cuts off the fuel supply and sounds an alarm. 24QJ5 is mounted on the burner control panel and includes a safety start circuit which prevents the burner from cycling if flame is detected or simulated prior to ignition. This system operates from two-wire thermostat or pressure switch and manual start pushbutton, and can be used on 115-230 volts, 60 cycles.

Steam Cleaner

A unit that is light, compact and powerful.

Homestead Valve Mfg. Co., Inc., Coraopolis, Pa., has introduced to the market a steam cleaner, designed especially for the need of small industrial plants, small contractors, garages, etc., called the Service Master Hypressure Jenny.

The cleaner requires only 27 in x 37 in floor space, but develops 80-120 lb working pressure. Its normal 45 gal per hr capacity can be increased to 240 gal per hr by means of a simple accessory, the Adjusta-Blast Gun, also manufactured by this company.

This new unit is said to have such features as instant starting and steaming, automatic nozzle control mechanism which permits the operator to stop and start the machine at the cleaning job, and selective compound and fuel feed to give best results for the individual job. All units are oil fired and electric motor driven.

Chlorinated Hydrocarbons

Compatible with such resins as vinyl chloride, styrene and rosin.

A new product, known as Chlorinated Hydrocarbon-70, has been announced by Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Pa.

The new chlorinated hydrocarbons is a clear, viscous resinoid, claimed to have good thermal stability and showing no hydrolysis during 16 hr contact with water at room temperature and at 100 C. The manufacturer also claims that this new product has no flash point and no fire point, and is completely soluble in most alcohols, ketones and hydrocarbons, at room temperature.

According to laboratories who made a series of preliminary physiological tests, direct contact of the product to the human skin produced no adverse effects during a period of five days. Also, to test acute vapor toxicity, animals were exposed to

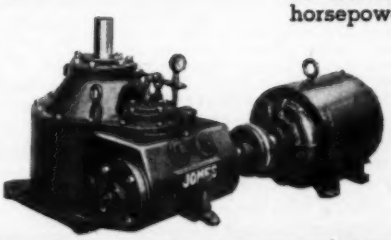
For driving agitators, mixers and similar equipment—

JONES WORM-HELICAL SPEED REDUCERS

HERE is a line of machines that fills a long felt need for double reduction units of the fully enclosed type to be used for agitators, mixers, etc. requiring a vertical shaft drive.

Many of these Jones units have established excellent performance records in a wide variety of service. As a result of that experience a complete standard line has been developed covering 15 standard ratios ranging from 40 to 1 to 250 to 1 for all common motor speeds and a wide range of horsepower ratings.

• This Jones Worm-Helical Speed Reducer on a lacquer agitator is typical of the wide range of services for which these drives can be used such as ore roasters, pulp tank mixers, furnaces, bending rolls and similar applications.



The new Jones Bulletin No. 75 covers complete details on these new Worm-Helical Speed Reducers, with rating tables, dimension diagrams, torque charts and other application information. We shall be pleased to send you a copy.

W. A. JONES FOUNDRY & MACHINE CO.
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HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS • PULLEYS
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FAST WAY TO CLEAN Drying Roll Frames

LONG-NEGLECTED gear-side and frames of drying roller section of papermaking machine may be cleaned quickly and safely this economical Oakite way:

Use the Oakite Sprayer, Model No. 374, with union-type nozzle, to apply full-strength solution of fast-acting Oakite Renovator. Spray solution over all exposed surfaces, allow to soak, then apply a hot-water pressure hose rinse. Oil, grease and dirt are thoroughly removed. Other time-saving procedures in 28-page Oakite Papermill Booklet. Write for it TODAY. Free without obligation. Oakite Products Inc., 16 Thames St., New York 6, N.Y.

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SPECIALIZED INDUSTRIAL CLEANING
MATERIALS • METHODS • SERVICE

concentrated vapors evolved from the heated material for a period of eight hours and no untoward reactions were detected.

The manufacturer states that the new chlorinated hydrocarbons have properties which suggest their use in many industrial applications such as a plasticizer, flame retardant, in the manufacture of adhesives, and in other formulations for the impregnation or coating of wood products, textiles and paper.

Filter Cloths

Have high strength-weight ratio, even at elevated temperatures.

Filtration Engineers Inc., Filtration Fabrics Div., 155 Oraton St., Newark 4, N.J., have available new chemical and bacteria-resistant filter fabrics of Feon Orlon, woven to rigid Filtration Fabrics specifications. These fabrics are claimed to be excellent for strong mineral acids, common solvents, oils, greases and acid solids, and come in a wide range of weaves that are easy to clean, non-binding, and more durable than previously available cotton cloths.

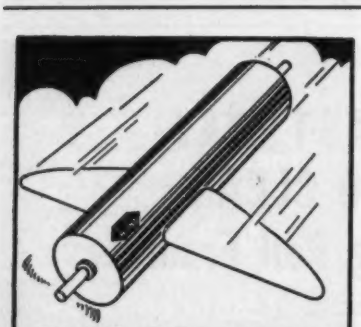
The orlon filter cloths are tailored to fit most types of filters, including all rotary filters, and are available for all types of filters, rotary filters and filter presses alike.

Fire-retardant Paint

Requires no mixing of special ingredients.

A fire-retardant paint and coating has been introduced to the market by Stallton Chemical Corp., 8-14 37th Ave., Long Island 1, N. Y. This new product, called Flame-Seal, is claimed to generate no smoke or toxic gases when attacked by fire nor give off toxic fumes while being applied. It is described as an ideal protective coating for all interior raw wood surfaces and for use on wood walls, ceilings, basements, attics, stairwells, etc.

The manufacturer claims that the paint undergoes a complete physical transformation, when fire attacks wood, by forming a "magic" white crust which creates a hard protective wall at least 8 times the thickness of the original coating. It is said to be moisture-proof and termite-proof and it will not craze, chip, peel or crack. It can be washed with any standard soap or washing powder without lessening its fire-retardant effectiveness. Flame-seal is available in an oyster-white flat finish and can be obtained in single quarts, 2- and 5-gal cans and 55-gal drums.



FAST DELIVERY ON "SHAF-TITE"* ROLLS

FOR WET FELTS

plus patented features that give greater value.

Write for Catalog!

RODNEY HUNT MACHINE COMPANY

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Briefs . . .

▶ ELECTRICALLY HEATED RUBBER—The B. F. Goodrich Co., Akron, Ohio, has announced an electrically heated rubber which is constructed of resistance wires insulated with fabric plies sandwiched between layers of rubber sheeting with the parallel wires running the length of the rubber. The rubber can be furnished in any reasonable size, shape or weight and for temperature up to 300 Fahr.

▶ OUTSIDE WINDOW FAN—Chelsea Fan & Blower Co., Inc., 1206 Grove St., Irvington, N.J., has produced a new belt driven outside-window-frame fan of sufficient size to comfortably cool small to medium sized offices, shops, etc. The AP 24-in fan has an air output of 4500 cfm, ¼ hp motor and single fan speed of 620 rpm; AP 30-in has an air delivery of 6500 cfm, ¼ hp motor and single fan speed of 500 rpm; AP30H has an air delivery of 8200 cfm, ½ hp motor and fan speed of 620 rpm.

▶ LOAD CARRIER TRUCK—Market Forge Co., 80 Garvey St., Everett, Mass., has introduced a new form of equipment utilizing its standard Load Carrier Truck with a 275-gal aluminum or steel tank mounted in a cradle. It can be used to supply booster pumps with water in case of fire, for transporting oil about large plants and for transporting other liquids. The standard truck is 30 in wide x 63⅜ in long with two 12 x 2½-in wheels and two 6 x 2 swivel casters cushioned in rubber.

▶ LANTERN SUPPORT—Pucel Enterprises, Inc., 3746 Kelley Ave., Cleveland 14, Ohio, has manufactured a lightweight, non-corroding, sturdy steel "positive-grip" Lantern Saf-T-Stand. It is claimed that because of the stand's design it averts lantern-breakage by preventing toppling or blowing over or spillage of fuel, and reduces lantern theft, and is indispensable for excavation work, road repair work, material stock-piles, or emergency use.

▶ WELDING ALLOY—Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N.Y., has introduced two new "Economizer" kits containing welding alloy and flux, one kit for aluminum welding and one for welding zinc die casts. Also, this manufacturer has available a new wall cabinet which includes "Economizers" and accommodates from seven to nine different types of welding alloys in standard packages.

▶ STRIP COATINGS—H. B. Davis Co., Bayard and Severn Sts., Baltimore 30, Md., has announced the manufacture of webbable and strippable coatings for packaging standby equipment for long term outdoor storage.

▼

Lubrication and Its Effect . . .

(Continued from page 620)

vary slightly up or down on different machines.

Even though an oil having the desired characteristics is used, it will not perform satisfactorily if handled improperly. The capacity of the lubricating system should be such that the oil is allowed at least one to two hours rest before being recirculated. Some of the circulating systems on the newer machines contain as high as 12,000 gallons. Full flow filtration is necessary if the oil is to be maintained in good condition. Most systems employ bag type filters. Such bags should be cleaned frequently. The frequency of cleaning will vary with the machine conditions. Some mills supplement their bag type filters with centrifuges and cellulose packed filters arranged on a by-pass set-up. Another aid to keeping the system in good condition is to clean the settling tanks periodically. Some mills use an extra tank large enough to hold all of the oil in the system. Once a year the entire batch is pumped into this extra tank and the regular tanks cleaned. Proper handling of the oil in these systems cannot be emphasized too strongly.

Equipment in the yard, wood room, pulp mill, beater room, etc., as well as the wet end and press sections of the paper machine, have not been covered, but opportunities for power reduction through improved lubrication exist with this equipment also. Ambient and service conditions here too must be carefully analyzed before the proper lubricant is selected. Of necessity, this equipment can only be covered generally by describing the types of lubricants available to meet the various conditions usually found in these parts of the paper mill.

Extreme pressure lubricants have a very definite place in the paper mill. These lubricants are available in a wide range of viscosities and have definitely proven themselves to be greatly superior to other types of lubricants for all types of enclosed gear drives, particularly of the hypoid and worm type. They have also proved themselves to be extremely effective on slow moving and heavily loaded bearings of both the plain and anti-friction type.

As discussed previously in connection with dryer journal lubrication, there is a definite need for oils of high quality which have high chemical stability. These oils are available in the medium viscosities suitable for circulating systems, as well as in the heavier grades for use on those bearings lubricated by ring or collar or those anti-friction dryer bearings lubricated by constant level devices.

New Literature . . . . . .

Regulators and Steam Specialties. O. C. Keckley Co., 400 W. Madison St., Chicago 6, Ill.—No. 49, Thirty-Fifth Anniversary illustrated catalogue features precision pressure regulators, temperature regulators, combination pressure and temperature regulators, float valves, self-cleaning strainers, water gauges and steam traps. It includes dimensions, capacities, engineering tables and specifications.

Non-flammable Plasticizers. Monsanto Chemical Co., St. Louis 4, Mo.—5-page Bulletin No. P-138 describes the use of Aroclor 1254, chlorinated biphenyl, as a lubricant in the manufacture of fire-resistant paper drapes and as a co-plasticizer for the vinyl coating on paper drapery material. Suggested emulsions, procedures and dermatological and toxicological data are included. Specific uses suggest other similar applications for Aroclors in the paper products industry.

Research. Research Institute of America, Inc., 292 Madison Ave., New York 17, N. Y.—32-page booklet is an analysis of problems facing the businessman today and outlines steps to overcome uncertainties of the future. Four parts cover the following points: How to check your current position; how to analyze your vulnerability; how to project sales, costs, cash, margins; figuring your future position.

Motors. Electric Machinery Mfg. Co., Minneapolis 13, Minn.—16-page booklet entitled "E-M Synchronizer" No. 26 describes and illustrates enclosed a-c motors manufactured by this company. A simplified diagram of a pulp and paper mill shows a few of the large a-c motor drives. An index, with illustrative sketches, gives some large a-c motor requirements of pulp and paper mills. Factors in selection of large a-c units with an accompanying table on torque, kv-a and slip characteristics are included.

Plastic Fabricating Machines. Taber Instrument Corp., North Tonawanda, N. Y.—6-page folder illustrates and gives specifications of various models produced by this company.

Steam Cleaning. Du Bois Co., Industrial Div., Cincinnati 3, Ohio—10-page portfolio describes steam cleaning and its industrial applications. Incorporated in its pages are advantages of steam cleaning, analysis of steam cleaning, compound requirements and general applications. Various plants using steam cleaning methods are listed and case histories of actual application are given. Directions for descaling the coils of Steam Jennies prior to the use of Sprex A.C. steam cleaner, manufactured by this company, are included in addition to description and uses of the product.

Samplers. Hardinge Co., Inc., 240 Arch St., York, Pa.—8-page Bulletin No. 47 describes in detail the operating mechanism of this company's new automatic sampler and includes typical installation arrangements for both wet and dry processes. Dimensional sketches with parts identification and parts list are given. List of bulletins published by this company are included.

Unit Fabrication. Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.—4-page folder explains the advantages and economies of factory unit-fabrication of welded piping headers, assemblies and valve groupings into one-piece pre-tested units. Plant facilities are discussed and sample uni-fabrications are shown and analyzed.

Process Control. Norcross Corp., Newton 58, Mass.—8-page Bulletin No. V-1000A describes and illustrates the recording viscometer, a new viscosity process control for industry, manufactured by this company. Design and operation of the instrument are shown, with a schematic view of the bottom part showing plunger arrangement. Typical illustrations of installations and charts on how the viscometer eliminates guess work and maintains uniformity in warp sizing are included.

Steam Power Film. Babcock & Wilcox Co., 85 Liberty St., New York 6, N. Y.—4-page Bulletin No. G-69 describes "Steam for Power," an educational 16 mm sound film in color of man's efforts to obtain more economical power by using steam to harness the energy released by the combustion of fuels. Twenty stills taken from the film show some of the important steps in the history of steam power. Explanatory captions accompany each picture.

Coating Materials. Dow Chemical Co., Coating Div., Midland, Mich.—18-page illustrated booklet deals with the use of 512K as a pigment binder, in blends with other adhesives and its use in coating colors. Properties and physical constants of this material are included. Types of coating equipment, drying, calendering and reactions of this product on printing papers are explained.

Water Meter. Layne & Bowler, Inc., P. O. Box 215, Hollywood Station, Memphis 8, Tenn.—40-page, book-size booklet entitled "Measurement of Water Flow through Pipe Orifice with Free Discharge" explains this company's method of computing water flow. It tells how to use it, how accurate it is, gives flow graphs for various pipe sizes and method of computation.

Conveyor. Rapid-Standard Co., Inc., Grand Rapids 2, Mich.—4-page folder, Form FVA-149, illustrates applications of the Floor-Veyor, Jr. conveyor in several of the many fields served by this company. Photographs show this unit being used to carry merchandise from basement packing areas to the main floor shipping dock of a store and warehouse. Construction features are described. A line drawing shows details of the conveyer's bed and frame, with all parts identified. Complete specifications of inclined and horizontal models are included.

Stud Gun. Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8, Pa.—4-page Bulletin No. TA-17 describes and illustrates the MSA Velocity-Power Driver, a power actuated tool for driving studs, manufactured by this company. Section drawing shows interior of driver, with parts identified. Four pictures of typical applications are shown, also lists of stud units available.

Color Guide. International Printing Ink, Div. of Interchemical Corp., 350 Fifth Ave., New York 1, N. Y.—A new color guide for news inks offers help in choice of hundreds of color combinations in harmonious or contrasting groups. Thirty colors are shown in a practical format of unusual design, also 8 halftone web colors, and 16 run of paper colors placed to cover the hues of a color circle for a quick choice of in-between colors. Included is a section on "under-printing" colors.

Materials Handling. Dempster Bros., Inc., Springdale Ave. and Shea St., Knoxville 17, Tenn.—9-page mimeographed Bulletin No. PM 649 contains a list of companies using the Dempster-Dumpster system in trash and refuse handling. This list supersedes the copy dated October 29, 1948.

BOOK REVIEWS

American Management Series—A number of bulletins published by American Management Association, 330 W. 42nd St., New York 18, N. Y. General Management series: Number 141, "Worker Morale and Productivity," 38 pages, 75c per copy; Number 142, "Organization Controls and Executive Compensation," 54 pages, $1.00. Insurance series: Number 78, "Advances in Insurance Coverage—Accident Prevention and Control," 39 pages, 75c. Office Management series: Number 124, "Appraising and Training Office Supervisors," 39 pages, 75c. Packaging series: Number 25, "Cost Controls for Packing, Shipping and Warehousing," 31 pages, 75c; Number 26, "A Primer on Basic Types of Shipping Containers and Interior Packing Pieces," 31 pages, 75c. Personnel series: Number 120, "Executive Personality and Job Success," 35 pages, 75c; Number 121, "Personnel Functions and the Line Organization," 31 pages, 75c. Production series: Number 179, "Building Quality into Manpower," 35 pages, 75c; Number 178, "New Controls for Fixed and Variable Costs," 39 pages, 75c; Number 180, "Administrative and Statistical Techniques of Quality Control," 34 pages, 75c; Number 181, "Management's Role in Industrial Mobilization," 27 pages, 50c; Number 182, "The Basis of Production Planning," 24 pages, 50c; Number 183, "Building Worker Interest in Production Problems," 34 pages, 75c; Number 184, "Organizational Teamwork in Production," 32 pages, 75c. Size of booklets, 6 x 9 in.

Research in Southern Regional Development—By Edith Webb Williams. This is Monograph 3 in a series entitled Studies of Southern Resources made by the Institute for Research in Social Science, University of North Carolina, for the Southern Association of Science and Industry.

In this book Dr. Williams, formerly research associate in the Institute for Research in Social Science, discusses the need for research in the regional development of the resources of the South. The book is divided into five sections, each treating on some phase of research and its connection with southern regional development; and each illustrated with charts and graphs which give more emphasis to certain points made in the text. The first, Research as a Resource, deals with such subjects as Southern Research and National Research, Investigating Research Resources and a Broad View of Research Resources. The second section, The Research of Private Business and Industrial Concerns, touches upon Industrial Research in the Nation, Industrial Research in the South, Private Agricultural Research and Research through Co-operation of Industrial and Business Companies.

The remaining chapters, Research in Colleges and Universities, Governmental Research, and finally, The Development and Use of Research Resources—A Challenge to the South; discuss the various problems which fall in their individual categories.

This is a paper bound book which is published by the Dietz Press, Inc., Richmond, Virginia.

University of Illinois Bulletin—Papers Presented at the First Short Course on Industrial Packaging and Materials Handling, by The Engineering Experiment Station, University of Illinois. This is Circular Series No. 56 which consists of copies of all the papers presented at the above named meeting which was held at Chicago on October 4-7, 1948.

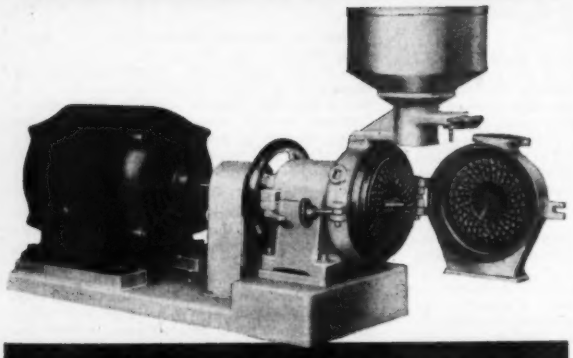
The papers cover packaging and materials handling, each subject being ably discussed by the individual speakers with question-and-answer sessions folowing some of the discussions.

Materials handling papers cover such subjects as Plant Layout from a Materials Handling Standpoint; Work Simplification; The Principles of Materials Handling and the Materials Handling Engineer; Rules and Regulations of Loading, etc.

Packaging covers the subject of an Approach to Container Specifications, wherein the speaker explains various steps in obtaining the right container; Control of Container Quality from the User's Viewpoint, a discussion on container performance tests; Case History of a New Pack; Control of Container Quality from the Manufacturer's Viewpoint, a discussion on how to attain quality in containers; Scientific Approach to the Development of New Containers, which gives five steps for the development of a new shipping container (1) establishment of the need for a new container, (2) concept of new container, (3) laboratory testing, (4) controled shipping tests, and (5) presentation for railroad acceptance. Survey tables are shown.

The book is paper bound, consisting of 248 pages, and is published by the University of Illinois, Urbana, Illinois. Price is $1.00.

FOR EXPERIMENTAL PULPING



Bauer NO. 148-1E LABORATORY MILL

For the study of fiber treating possibilities, this new 8-inch disc mill has a place in every laboratory. Small batches can be pulped for investigating many kinds of materials. These tests are particularly useful in predicting the behavior of semi-chemical cooked pulps. One of the outstanding advantages of the Laboratory Mill is its usefulness in quickly plotting beating curves. The Laboratory Mill can be employed for dry or wet grinding. When used for the latter purpose, it is equipped with a shower for adding water.

Since the head of the mill can be swung open for cleaning the interior, entire samples of test quantities can be recovered. The hinged door is also a convenience for changing plates, which are available in a variety of designs.

The mill is equipped with a 3- or 5-h.p. built-in motor or a sheave for V-belt drive. It will accept up to 20 h.p. input. The head is water cooled to dissipate frictional heat.

Numerous associations, societies, and institutions have approved and endorsed the Bauer Laboratory Mill for sample and test runs.

You are invited to request literature and data.

THE BAUER BROS. CO.

1759 SHERIDAN AVE.

SPRINGFIELD 99, OHIO

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Blue Overalls	6.50 to 6.75
Corduroy, Men's	5.75 to 6.00
Corduroy, Ladies'	5.75 to 6.00
Washables, No. 1	4.00 to 4.25
Percales	6.25 to 6.50
Light Prints, No. 1	5.75 6.00
Khaki Cuttings—	
Bleachable	5.75 to 6.00
Unbleachable	5.00 to 5.25
New White Canvas	11.50 to 12.0
New Mixed Blacks	5.00 to 5.25
Canton Flannels, Bleached	10.75 to 11.00
Shirt Cuttings—	
New White No. 1	10.50 to 11.00
White Shrunk	10.00 to 10.25
Silesias No. 1	8.00 to 8.25
New Unbleached	10.50 to 11.00
Fancy	5.50 to 5.75
Linen Cuttings—	
American	8.00 to 8.50
White	14.00 to 15.00
Grey	13.50 to 14.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	1.15 to 1.20
No. 2	1.05 to 1.10
No. 3 and No. 4	.85 to .95
Twos and Blues—	
Repacked	3.00 to 3.25
Thirds and Blues—	
Repacked	2.75 to 3.00
Miscellaneous	2.25 to 2.50
Whites, No. 1—	
Repacked	4.75 to 5.00
Miscellaneous	3.50 to 3.75
White, No. 2—	
Repacked	3.50 to 3.75
Miscellaneous	2.75 to 3.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	8.00 to 8.50
Wool Tares—	
Light	8.00 to 8.50
Heavy	8.50 to 9.00
No. 1 Scrap Bagging	6.00 to 6.50
Manila Rope—	
No. 1 large	5.50 to 5.75
No. 1 small	4.50 to 4.75
Sisal Rope—	
No. 1 large	5.00 to 5.25
No. 1 small	4.50 to 4.75
New Burlap Cuttings	7.50 to 8.00
Jute Threads—	
Foreign (Nom.)	6.50 to 7.00
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	4.50 to 4.75
No. 2 sisal	4.00 to 4.25
Soft jute	4.25 to 4.50
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

Shavings—	per ton
Hard White Env. Cuts.	95.00 to 100.00
Hard White, No. 1	75.00 to 80.00
Soft White No. 1	70.00 to 75.00
Soft White, one-cut	85.00 to 90.00
Soft White, Misc.	55.00 to 60.00
Fly Leaf, No. 1	27.50 to 30.00
Fly Leaf, Woody No. 1	22.50 to 25.00
No. 2 Mixed Col. Woody	17.50 to 20.00
Flat Stock—	
No. 1 Heavy Books and Magazines	18.00 to 19.00
Mixed Books	13.00 to 14.00
Ledger Stock—	
No. 1 White	40.00 to 45.00
No. 1 Mixed (Colored)	30.00 to 35.00
Manilas—	
New Env. Cuttings	60.00 to 65.00
New Env. Cuts, One-Cut	—
Extra Manilas	—
Manila Tab Cards, Free of Ground Wood	65.00 to 70.00
Colored Manila Tab Cards	35.00 to 40.00
Kraft—	
New Envelope Cuttings	60.00 to 65.00
Tripled Sorted No. 1 100%	30.00 to 35.00
New 100% Cor. Cuts	30.00 to 35.00
No. 1 Old Assorted	25.00 to 27.50
News—	
White Blank	40.00 to 45.00
Overissue	13.00 to 14.00
No. 1 Baled	8.00 to 9.00
Old Corrugated Containers	11.00 to 12.00
New Jute Corrugated Cuts	18.00 to 19.00
Mill Wrappers	6.00 to 7.00
Box Board Chips	5.00 to 6.00
No. 1 Mixed Paper	5.00 to 6.00

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.05—
Ground, cwt.	3.80—
Powdered, cwt.	4.20—
Blanc Fixe—	
Pulp, bulk, ton	77.50—
Dry, barrels	85.00—
Bleaching Powder—	
Drums, cwt.	4.25 to 4.50
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	20.00 to 20.50
Argentine, lb.	19.50 to 19.75
China Clay—	
Domestic Filler	
Bulk (mine) ton	10.00 to 15.00
Domestic Coating	
Bulk (mine) ton	15.00 to 25.00
Imported (ship side)	
Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.40 to 2.70
Gelatine (silicin), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	.24½ to .25
Litharge, powd. bbl. lb.	.15¾ to .16
Rosin (Gum)—	
New York, per 100 lbs.	
E	7.45—
F	7.45—
G	7.45—
WWX	7.50—
Rosin (Wood), carlots, F.O.B. South	4.25 to 4.50

MARKET QUOTATIONS

Salt Cake—	
Dom. bulk (wks) ton	22.00 to 24.00
Imp. bulks on dock—(Atl. ports) ton (Nom.)	25.00—
Soda Ash—	
Bulk (works), cwt.	1.10 to 1.20
Paper Bags, cwt.	1.30 to 1.40
Barrels, cwt.	1.70 to 1.80
Soda (Caustic)—	
Solid drums, cwt.	3.05 to 3.10
Ground and flake, drums, cwt.	3.45 to 3.50
Sodium Silicate—	
60 deg. 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg. 35 gal. drums, (works), cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	4.92—
Pearl, barrels, cwt.	4.92—
Paper, (Sp.) bags, cwt.	4.92—
Powdered, barrels, cwt.	5.03—
Sulphur (Crude)	
(Mine) bulk, long ton	16.00 to 18.00
Talc—	
Dom. 100 lb. bags (mine) ton	22.00 to 28.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig, bbls., lb.	.19½ to .21
Calcium Pig, bbls., lb.	.19½ to .21
Zinc Sulphide, bbls., lb.	11.50 to 11.75

WOOD PULP

Prices, dollars per short, air dry, ton, on dock American ports and f.o.b. shipping points with former OPA freight allowances, are:

Bleached sulphite, Swed.	118.00 to 122.00
Bleached sulphite, Finish.	118.00—
Bleached sulphite, dom.	118.00—
Easy bleaching sulphite	—
Unbleached kraft, Finn.	94.00—
Unbleached sulphite, Swed.	100.00 to 105.00
Unbleached sulphite, Fin.	115.00—
Unbleached sulphite, dom.	100.00—
Unbleached kraft, Swedish	94.00 to 97.00
Unbleached kraft, northern	94.00 to 105.00
Unbleached kraft, southern	80.00—
Bleached sulphate, Swedish	126.00 to 128.00
Bleached soda, domestic	113.00—
Sulphite screenings, dom.	40.00 to 50.00
Sulphate screenings, dom.	40.00 to 50.00
Groundwood, domestic and Canadian	60.00 to 65.00

PAPER

f.o.b. New York City

	per ton
Boards—	
Binders	94.00—
Chip	65.00—
Chip, tube and can	70.00—
Chip, full blending	72.50—
Chip, sgl. mla. lined	72.50—
Coated, white patent	
.016	110.00—
.020 and heavier	100.00—
Kraft liner	95.00 to 105.00
Filled News	67.50—
Container	85.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)
Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	15.40—
B Grade E.F.	14.40—
A Grade S. C.	15.90—
B Grade S. C.	14.80—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White (Trimmed 4 sides)	
No. 1 Glossy	20.75—
No. 2 Glossy	19.50—
No. 3 Glossy	18.15—
No. 4 Glossy	—
No. 2 Offset	14.80—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

	per cwt.
Rag Content Bond— (In Ton Lots)	
Extra 100% Rag	51.40—
100% Rag	44.55—
75% Rag	33.90—
50% Rag	28.10—
25% Rag	24.85—

	per cwt.
Rag Content Ledger— (In Ton Lots)	
Extra 100% Rag	52.65—
100% Rag	45.65—
75% Rag	35.15—
50% Rag	29.40—
25% Rag	26.15—
Sulphite Bond—	
Air dry, watermarked	—
No. 1 watermarked	17.50—
No. 2 watermarked	16.60—
No. 4 watermarked	15.50—
Sulphite Ledger—	
	Zone
No. 1 watermarked	18.80—
No. 2 watermarked	18.05—
No. 4 watermarked	17.50—
Glassine (f.o.b. mill)—	
Embossed (25 lb. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof—	
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—

	per ton
News—	
Rolls, Standard Contract)	100.00 to 103.00
Rolls (Spot)	(Nominal)
Sheets	119.00—

	per ream
Tissues (Carlots)—	
White No. 1	1.60—
White No. 2	1.20—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.45—
Manila	1.60—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.80—
Napkins, full crepe and smb'ssed (12½ lb. to M shts.) per cs.	.80—
Toilet, Bleached (M. shts.) per cs.	8.75 to 10.00
Toilet, Unbleached (M. shts.) per cs.	7.50 to 10.00

	per case
Towels—	
Bleached	4.75—
Unbleached	4.00—

	per cwt.
Wrappings (Kraft)—	
Super-Standard	8.00 to 8.50
No. 1 Wrapping	7.00 to 7.50
Standard Wrapping	6.25 to 6.75
Standard Bag	5.75 to 6.25
Variety Bag	—
Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)	
Bleached Papers—	
M.F. & M.G. Waxing, 20 lb. (Carloads only)	—
(10,000 lb.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers—	
Com. Gr. Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	—
Envp. Mla., Sub. 16-28 (No. 2)	—
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Wrapp Mla. 35 lb. up—	
No. 1	—
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B20 lb.	—
Grade A-22 lb.	—

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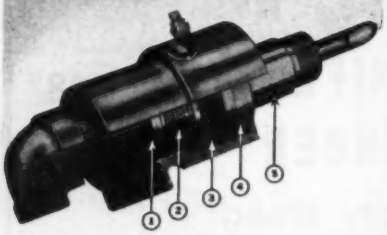

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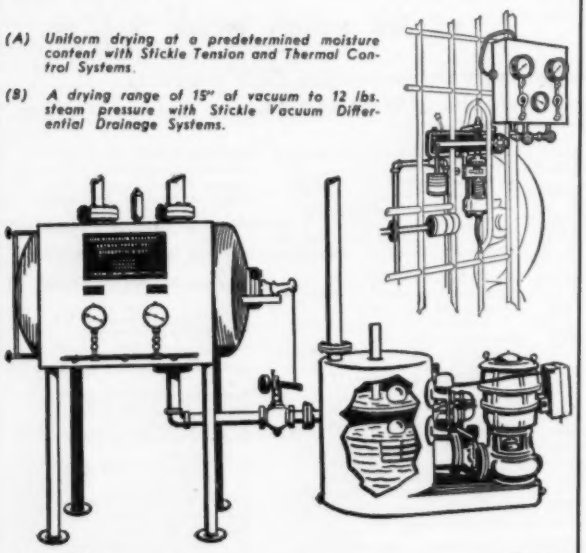

(C) The Stickle Automatic Differential Valve controls exact differential in pressure between sections of paper machine for proper drainage at all pressures.

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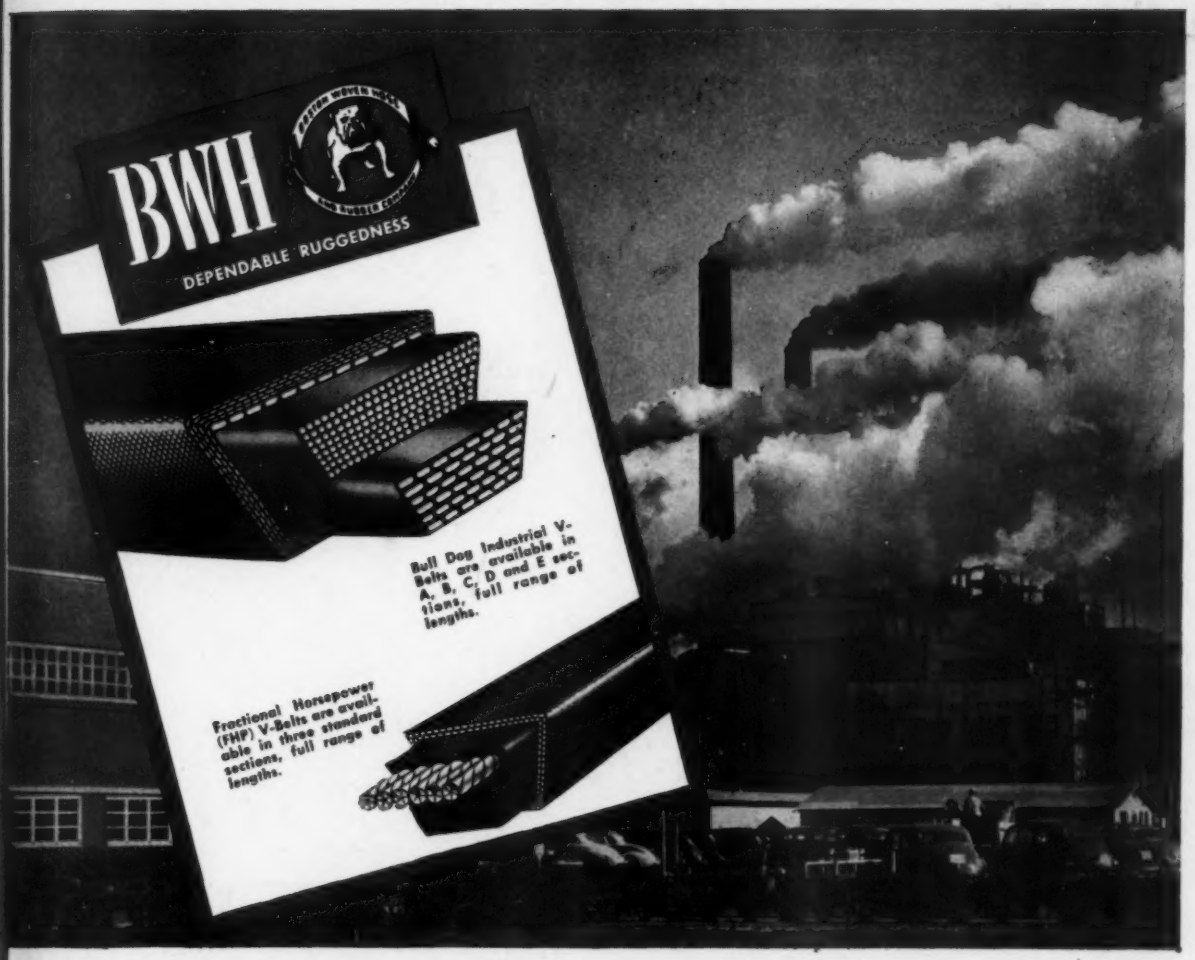
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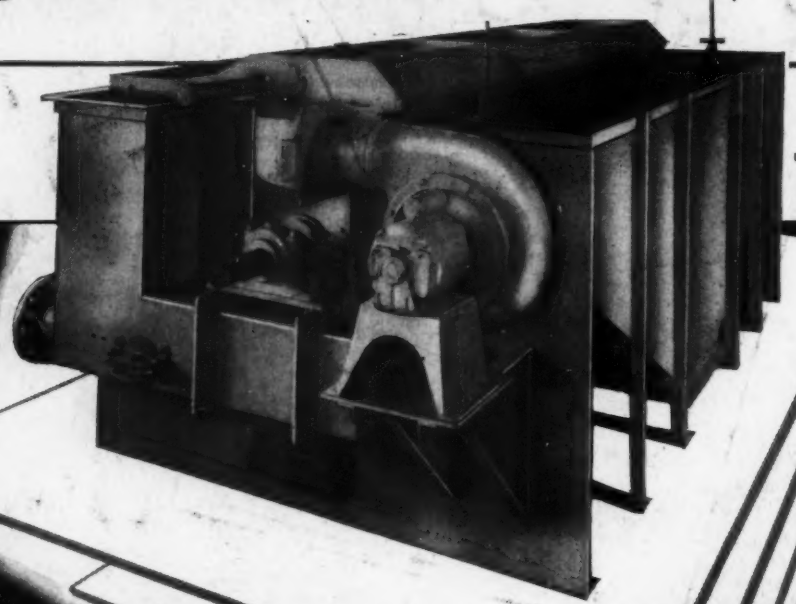

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